Scanned from the collections of
The Library of Congress



Packard Campus
for Audio Visual Conservation
www.loc.gov/avconservation

PROJECTIONIST

INTERNATIONAL

23 JAN 1956
Cont. Copy



JANUARY 1956

VOLUME 31 • NUMBER 1

30c A COPY • $2.50 A YEAR

No lamp in the World!

CAN PRODUCE SO MUCH LIGHT.

Peerless HY-CANDESCENT TRADE MARK REG

CINEARC

NOT A REFLECTOR ARC!

WRITE FOR DATA

Peerless MAGNARC TRADE MARK REG

CINEARC

A 75-77 AMP. REFLECTOR ARC!

22,000 TOTAL LUMENS ON SCREEN

NO-HIGH-RATE *OF ($60.00) REFLECTOR BREAKAGE AND SILVERING DETERIORATION OR HEAT FILTER UPKEEP* !

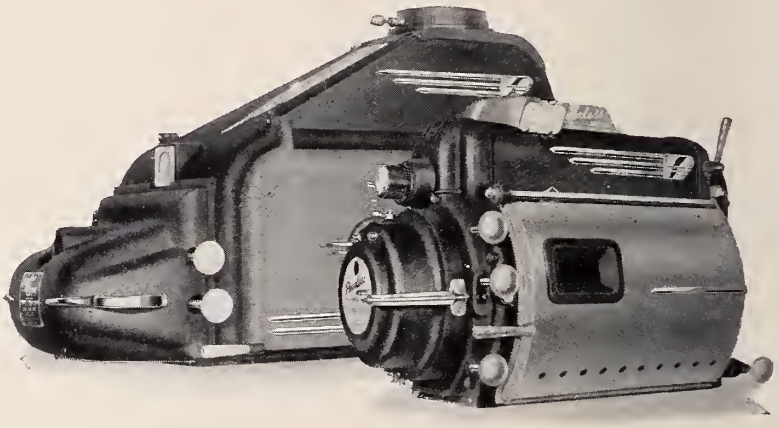
— PROOF —

Hy-Candescents were selected for all **important** "CINERAMA" installations. (Chicago, New York, Los Angeles, San Francisco, Philadelphia, and Washington, D. C.)

Hy-Candescents were chosen by Paramount for **all** Installations of Horizontal "VISTA-VISION".

Hy-Candescents were again selected by TODD-AO for "OKLAHOMA".

You have to do the same if you want all the light there is for big pictures.



At 75-77 amperes . . . With presently available and standard 8 x 9 m/m copper coated carbons . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . With a 14" diameter No. 2012 PEERLESS "Hy-Lumen" glass reflector that retails at a list price of $22.00 F.O.B. Chicago . . . With a No. 2880 PEERLESS Tail Flame Flue . . . On any kind or any size screen . . . No Heat Filter required.

All of this, at the **lowest** possible first, and operational **cost.** And

J.E.McAULEY MFG.CO.

552-554 WEST ADAMS STREET

CHICAGO 6, ILLINOIS

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

announcing the new "Red Arrow"

90 to 135 Ampere SELENIUM RECTIFIER

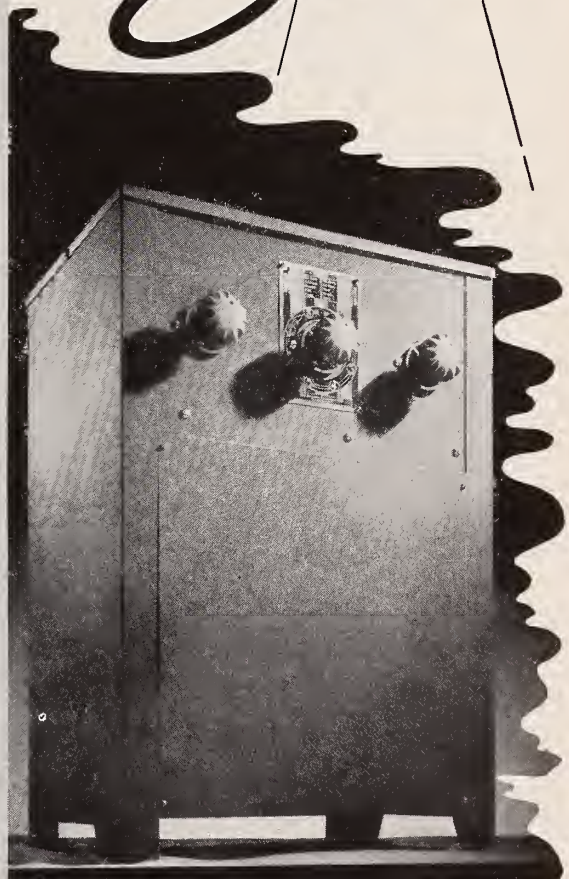
by Strong

Never Before Has Such a High Quality Rectifier Been Offered at Such a Low Price!

Engineered by arc lamp and rectifier specialists, the new Red Arrow possesses desirable features heretofore reserved for more costly equipment. It is without question the most efficient, economical rectifier ever developed for converting three phase alternating line supply current to direct current for use at the arc.

Output control is made simple by convenient tap switches located on the front of the rugged heavy gauge sheet metal case. The selenium plates are completely moisture-proof to insure reliable operation in damp climates.

Ventilation is by forced draft provided by a heavy duty fan which cools the plates to room temperature. The plates are sufficiently spaced so that the draft passes between them and in direct contact with the rectifying surface.



For use with angle or coaxial trim high intensity projection arc lamps

Send coupon today for complete information

THE STRONG ELECTRIC CORPORATION

31 City Park Avenue — Toledo 2, Ohio

Please send free literature on Strong Rectifiers.

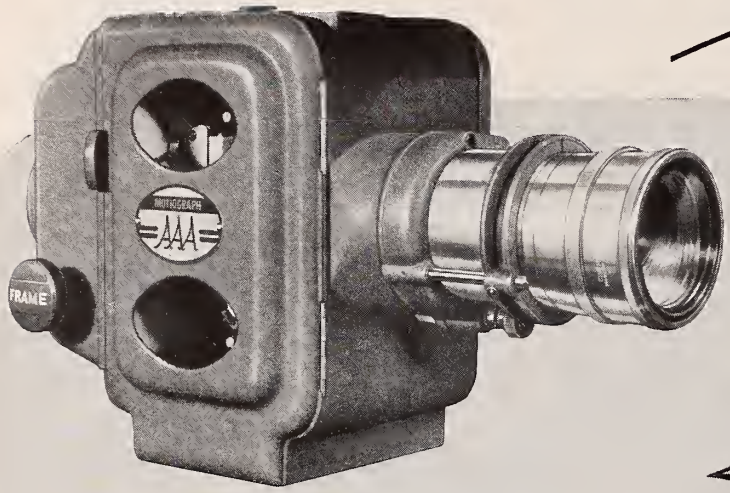
NAME_____

THEATRE_____

CITY & STATE_____

NAME OF SUPPLIER_____

The AAA Settles the Question of
WHICH PROJECTOR TO BUY



Before you buy any projector consider the features that make the Motiograph AAA truly advanced equipment—an example of perfection in engineering.

PROJECTS STANDARD OR CINEMASCOPE PRINTS, without changing shoes, sprockets, rollers or tracks, Apertures in ten ratios.

HIGHEST EFFICIENCY WITH 2-25/32" and 4" DIA. LENSES, ANY FOCAL LENGTH, any make. Lenses held firmly to the housing on "V" rails. The picture stays on the screen.

PERMITS CORRECT WORKING DISTANCE between aperture and 14", 16" or 18" mirror of new type arc lamps.

BRIGHTEST PICTURES on screens of any size. Barrel shutter (available with 52°, 60° or 72° blades) and heat baffle openings pass maximum light. No flicker or travel ghost.

MOST THREADING ROOM OF ANY PROJECTOR. Film gate opens full inch. Lighted framing aperture.

NO IN-AND-OUT FOCUS CONDITION. Variable shoe tension instantly adjustable to green, warped or buckled film of any thickness.

THE ONLY PROJECTOR WHICH CONTROLS FILM SWAY. Guide rollers self-adjust to film width.

ROCK-STEADY PICTURES assured by Motiograph's patented method of affixing intermittent sprocket to star shaft, and precision-made star, cam and sprocket.

PARTS CHANGEABLE BETWEEN REELS—aperture, tracks, shoes, upper magazine rollers. Intermittent movement removable from operating side. Intermittent sprocket reversed without removing assemblies. Quickly removable stud-mounted gear and bearing assembly.

INTERCHANGEABLE WITH PRACTICALLY ANY PROJECTOR MECHANISM. No new soundhead drives required. Accepts virtually all penthouse reproducers and upper magazines.

QUIET RUNNING, compressed linen gears against hardened steel. No metal to metal, hence unbelievably long service. Run on double-row lifetime-lubricated ball bearings.

PARTS AVAILABLE AT LEAST 20 YEARS. That's Motiograph policy.

COOL OPERATION. Water cooled gates and aperture cooling blowers optional.

Your Motiograph dealer will gladly demonstrate the AAA—the finest projector in history. He has a liberal financing plan. Write today for literature.

MOTIOGRAPH, INC.

4441 W. LAKE STREET "Since 1896" CHICAGO 24, ILLINOIS

Export Division (Except Canada): Frazar & Hansen, Ltd. 301 Clay Street, San Francisco 11, Calif.

INTERNATIONAL PROJECTIONIST

R. A. ENTRACHT, *Publisher*
JAMES MORRIS, *Editor*
R. A. MITCHELL, *Contributing Editor*

Volume 31 JANUARY 1956 Number 1

Index and Monthly Chat 5

A New Method of Designing Lenses 7
Dr. Max Herzberger

Non-Sync Sound Reproduction Through Surround Speakers 10
Joseph F. Holt

Cropped Titles Create Problems for Wide-Screen Art Houses 12

Arclamp, Projector Optics Must Match Each Other 13

Color and Its Reproduction on Film, II 14
Robert A. Mitchell

1945 to 1955: Ten Years of Projection Advances, II 17

In the Spotlight 20

Letters to the Editor 22

Conematic Arc Has Photocell Control 23

New 8-mm Copper-Coated Carbon Designed for 60-70 Ampere Arclamp Operation..... 26
F. P. Holloway and R. B. Dull

IA Elections 27

Obituaries 30

Index — January to December, 1955 32

INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co., Inc., 19 West 44 Street, New York, 36, R. A. Entracht, President. Telephone: MUrray Hill 2-2948. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States and U. S. Posessions, $2.50 per year (12 issues) and $4.00 for two years (24 issues). Canada and Foreign countries, $3.00 per year and $5.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Entered as second-class matter February 8, 1932, at the Post Office at New York, N. Y., with additional entry at Yonkers, N. Y., under the act of March 3, 1879. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles.

Contents copyrighted 1956 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

SE

Monthly Chat

Any Fire Can Be Deadly

FIRE, with billowing smoke and poisonous fumes issuing from the projection room, is a calamity now less likely to occur than in the days when nitrate film base was standard for all motion picture release prints. While this fact may be cause for comfort, it is hardly cause for relaxing fire-prevention discipline. The fire hazard in all theatres is still great, and even a small fire can start a deadly panic.

Last month the New York City Fire Department conducted surprise raids and found widespread violations in theatres. One to four violations were found in 17 out of 39 theatres inspected during a single day. But when 20 additional theatres were inspected the following day, only two out of these 20 theatres were found to be violating fire laws. It was remarked by the fire commissioner that, in most of the theatres visited on the second day, the inspection was anticipated and there was evidence that violations had been hastily cleared up. Evidently just about all of these fire hazards were of a minor type that could have been easily avoided with just a little effort.

It should always be remembered that a chief cause of injury and death when theatre fires occur is not fire or smoke or collapsing walls—but panic. A relatively harmless electrical fire which is quickly extinguished, for instance, may still generate enough smoke to send patrons stampeding and trampling each other to reach exits. Careful attention to the Underwriters Laboratories' recommendations is particularly important these days when equipment is likely to be running near the overload point. In a forthcoming article, IP will investigate theatre fire hazards with particular attention to the projection room.

Technical Assistance from Hollywood

PROJECTIONISTS at many poorly designed theatres—often these are theatres that were designed primarily as vaudeville houses for live shows rather than for the purpose of showing projected motion pictures—have been laboring under great difficulty in trying to keep a reasonably well-focused picture before their audience since wide screens were installed at their theatres. Good projection was very likely always a problem at these houses, but the greater depth of focus of the lenses used for the smaller screens current a few years ago helped to compensate for steep projection angles. Such a theatre is described in a letter from a projectionist printed in this issue of IP. He refers to his theatre in Arizona as a "projectionist's nightmare."

Evidently noticing the continuing bewilderment of some of the projectionists who must show the product that arrives in cans from Hollywood, the Motion Picture Research Council, located in that city and sponsored by the producing companies, is reported to be considering a plan whereby a technical expert will be engaged to travel about the country and, among other things, aid projectionists in correcting the projection faults inherent in many houses. He could also advise exhibitors about the limitations of the projection process in their theatres. This sounds like a big job for one man, but it is surely a start in the right direction.

NATIONAL TRADE-MARK

Carbons mean business:

■ Every element of exhibitor promotion contributes its share to the comfort and entertainment of your patrons. By far the most important of these elements is the *quality of the picture on your screen.*

That picture is *light,* and it's National Carbon's business to see that you get the *most* light possible at the *least* possible cost. It's bound to make a difference to your patrons — and *that* means business, too.

Be sure that *your* lamps are trimmed from the present line of "National" carbons. They're the finest ever made.

THE PICTURE IS LIGHT . . . GIVE IT ALL YOU CAN WITH "NATIONAL" CARBONS



The term "National" is a registered trade-mark of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY • A Division of Union Carbide and Carbon Corporation

30 East 42nd Street, New York 17, New York

SALES OFFICES:
Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco
In Canada: Union Carbide Canada Limited, Toronto

INTERNATIONAL PROJECTIONIST

VOLUME 31 JANUARY 1956 NUMBER 1

The lens designer is successfully solving many of the knotty problems brought on by the wide screen.

A New Method of Designing Lenses

By DR. MAX HERZBERGER
Eastman Kodak Research Laboratories

BY METHODS previously available for studying the action of lenses, only a few rays were traced from the object to the image. These rays gave only an incomplete picture of the actual image, and the information obtained from them was sometimes even misleading, since the best correction obtained for these special rays might not lead to the best image if the other rays from the object are not corrected at the same time.

As long as the lens under consideration has a small field and a small aperture—that is, small with respect to its focal length—the older methods were satisfactory, if these methods were combined with additional information obtained from a mathematical analysis. With the increasing demands for lenses of higher apertures, it was necessary to develop a method that would take all the rays into account and give an accurate picture of the image before the lens is made.

How a Design Is Tested

The image of a point formed by a lens is a minute patch of light a few thousandths of an inch across. Photographs of three such patches formed by an actual lens are shown at the top of Fig. 1. If the patch is small and circular, like the one marked A, the image is good. When it is larger and irregular in shape, like the one marked B and more especially the one marked C, the picture formed by all the points together tends to be unsharp. The new method enables the designer not only to make a picture of the patch of light representing each point in the object but also to analyze the shape of the patches and thus see how to make the lens behave satisfactorily.

When a photographic lens is being designed by this new method, a small number of points in the field are selected. Rays from each of these points passing through the lens at equal distances apart over the lens

About This Article

THE COMPLICATED laws of optical design are strange to most projectionists. Until a few years ago serious optical problems in the theatre were relatively infrequent. Since then the laws of optics have been strained by the requirement that more light be transmitted at wider angles to fill wide screens. This presents a difficult problem to the lens designer since even the best-designed projection lenses tend to lose sharpness as their focal length is decreased for a wider angle of throw and their speed increased for greater light-gathering ability. Using complicated formulas, lens designers have been striving to solve this problem by producing optics of increased sharpness as well as greater speed.

The accompanying article by Dr. Herzberger is particularly interesting because it provides projectionists with a clear and simple explanation of a method he developed to aid designers in producing still better lenses. Because of the simplicity of his presentation, this article is also an excellent introduction to the subject of optics.

A native of Germany, Dr. Herzberger now heads optical research at the Kodak Research Laboratories' physics division. He has long been recognized for his studies in geometric optics and related science. Before leaving Germany in 1934, he held high posts with both the Leitz and Carl Zeiss organizations.

surface are traced by mathematics to find where they strike the photographic film. Each point of intersection of a ray with the film is represented as a spot on a diagram. Since the rays are equally spaced when they pass through the lens, the closer they are together when they strike the film, the sharper the image is at that point.

In Fig. 1 such a spot diagram is shown below each image, and it is clear that the spot diagrams enable the designer to visualize the image in a way that numbers alone cannot. By taking rays from different points in the object being photographed and by plotting the resulting spot diagrams for different positions of the film, the quality of the lens can be determined. The spot diagrams are true representations of the image regardless of the size of the object being photographed or the size of the lens.

When this method was being developed, it was found possible to make an improvement over existing methods in another respect. To get a true picture, the paths of a large number of rays must be known. Tracing all these rays is slow, so we devised formulas that require the tracing of only nine rays from each of three points. The numbers that are used in

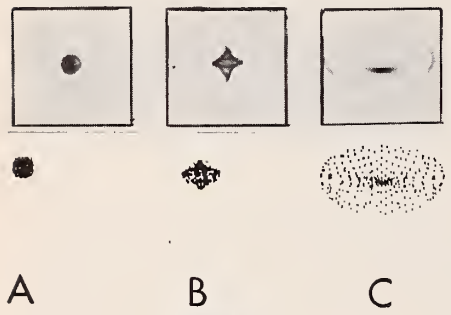


FIGURE 1

these formulas represent the position of each ray, and the formulas themselves consist of series of mathematical terms that are simply added together to give the point where each ray strikes the film. The points where other rays that were not traced would strike the film are then computed from the formulas.

The formulas consist of terms of the first, second, third, fourth, and fifth order. Since the terms of each order form a natural mathematical family, these terms can be divided into five groups, each containing terms of but a single order. These groups represent errors or aberrations, which

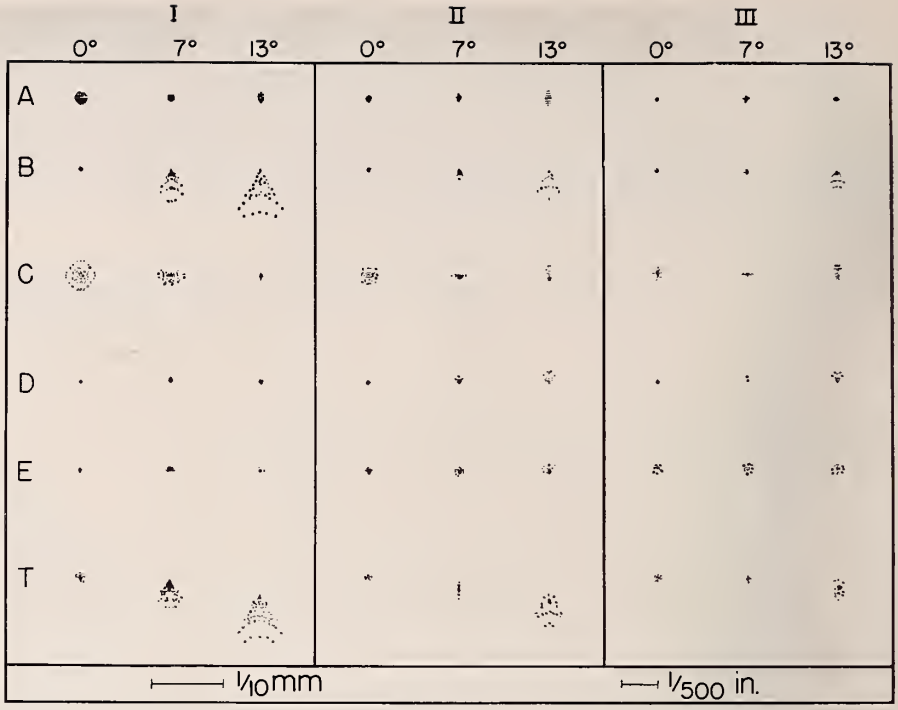


FIGURE 2

the designee tries to make as small as possible. Thus five spot diagrams, one for each aberration, that together add up to the spot diagram representing the actual patch of light formed on the film, can be plotted.

Changing such characteristics of the lens as the radii of curvature, the thickness of the individual elements, and the kinds of glass affects the various groups in different ways. If the lens forms a patch of light that is too large or is too poorly shaped to give a good image, it is easy to see from the five spot diagrams which group of terms is responsible for the poor performance and thus how to improve the lens.

Existing Designs Improved

This method has already been used to improve the performance of several existing lenses. The way this was done for one lens is shown in Fig. 2. The diagrams representing the patches of light formed by the original lens as computed by the older methods are shown in section I in the row marked T. The left-hand diagram in row T of section I shows the patch of light that would be made on the film by a point in the middle of the scene being photographed. The right-hand diagram shows the patch formed by a point at the extreme edge of the scene, and the middle diagram shows the patch formed by a point halfway between.

Although the patch of light in the center of the picture (the left-hand diagram) is fairly small and bright, the patch at the edge of the picture (the right-hand diagram) is faint and spreads out into a tail, like a comet. This tail is about 3/1000 inch long.

Tracking Down Faults

By means of the new formula, the diagrams in row T can be dissected into the five sets of diagrams marked A to E, each set representing one of the groups of mathematical terms mentioned previously. These diagrams show at once that group B causes the comet-shaped appearance of the patch of light at the edge of the picture shown in row T. The lens was modified by changing the shapes of the elements, and the result was a lens giving the spot diagrams shown in section II of the figure.

The aberrations of group B at the edge of the picture (the right-hand diagram) became much smaller than before, and the aberrations of groups A and C at the center of the picture (left-hand diagrams) were also reduced. The patches of light formed by the lens, as indicated by the diagrams in row T, were therefore much smaller than before. Nevertheless, they were still larger than was desired.

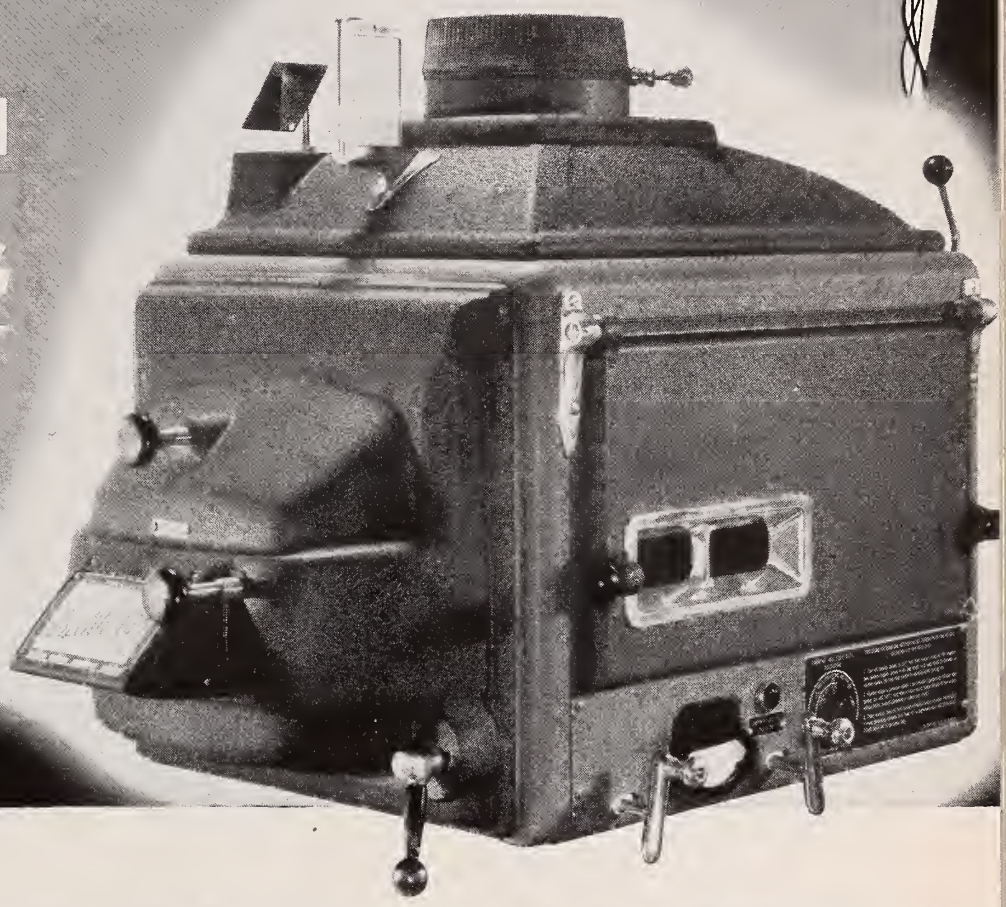
Another change was made in the shape of the lens and new computations were made, leading to the diagrams in section III of the figure. All

(Continued on page 31)

Far More Light

for *all*

PROJECTION TECHNIQUES



NATIONAL EXCELITE "135" Projection Arc Lamp

- Burn a choice of four carbon trims (9, 10, or 11 mm regular, or 10 mm Hitex).
- Long-life positive carbon contacts.
- 18″ f 1.7 or 16½″ f 1.9 reflector.
- Ventilated reflector and reflector frame.
- Correct amperage selection by a single control.
- Unit construction permits easy removal of elements for inspection in servicing.
- Reflect-O-Heat unit reduces heat at the aperture. Removable holder cooled by blower.
- Automatic Crater Positioning Control System insures that both carbons are so fed as to maintain a correct arc gap length and to keep the position of the positive crater at the exact focal point of the reflector. Screen light is always the same color, without variations from white to blue or brown.
- The arc is stabilized by a stream of air which maintains a prescribed system of ventilation of the area surrounding the arc. This air jet prevents the hot tail flame of the arc from reaching the reflector, supplies enough oxygen so that no black soot is produced, and keeps white soot from collecting on the reflector in such quantity as to absorb heat which would cause breakage.
- Water-cooled carbon contacts (optional.)

IT'S FROM N.T.S.

NATIONAL THEATRE SUPPLY
Division of National • Simplex • Bladwerth Inc

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

Non-Sync Sound Reproduction Through Surround Speakers

Described here is a method for adapting the fourth channel preamplifiers of a stereosound system for music and announcements that are not on the film.

By JOSEPH F. HOLT

Member, IA Local 428, Stockton, Calif.

INSTALLATION of "surround" speakers in the auditorium area of theatres has furnished excellent opportunity to improve the "presence" of non-synchronous sound furnished by turntable or tape instruments. The chief obstacle to easy use of these auditorium speakers has been the inconvenient methods provided for switching to obtain positive transfer of the signal.

A common difficulty encountered in using the output of a record player. for example, has been the fact that the fourth channel preamplifier is provided with an electronic "squelch." The use of a 12 kc. keying signal activates the fourth channel preamps, while at other times they are muted.

The writer experimented with various means of opening the electronic gate of the switching or "sensing" amplifier. The simplest method found was to remove one tube from certain makes of switching amplifiers. This action placed the fourth channel preamps in full-time operation. It is hardly necessary to mention that the method left room for improvement from the standpoint of convenience and silent operation.

Most Convenient Solution

Finally, it was noted that many stereophonic installations provide switching for three projectors, whereas only two stations have been utilized for magnetic inputs, and this discovery provided the basis for the solution discussed here. (See diagram below).

In the special condition we have mentioned, the usual arrangement is to provide sequence relays for three projectors, with an optical-magnetic relay wired for optical position in a de-energized condition. If the relay for the third projector is not used, one set of double-throw contacts is available for signal switching at the touch of a control button on any control panel in the room.

The first step is to remove the d. c. bias voltages from the contacts of the third projector relay. After the leads have been lifted from the relay terminals and the wires taped, the next step is to prepare for the introduction of the signal from the optical power amplifier into which the non-synchronous sound has been fed through its preamplifier.

The lead from the optical amplifier is isolated and bridged to one of the contacts made available by the removal of the bias leads from the third projector relay. The lead which provided for the "jumping" of the relay contacts by a toggle switch is also opened. The contact of the relay which will be operative when the projector number three relay button is depressed is then connected to the stage lines for the surround speakers.

After these changes have been made, the output of the optical amplifier may be fed at will through the fourth channel speakers. Precautions should be taken, therefore, that tally lights at each projector position indicate which relay is punched up. It is also desirable that the fourth channel speaker monitor should be isolated from the channel two monitor, or the optical monitor speaker, as the case may be, to provide aural verification of signal destination.

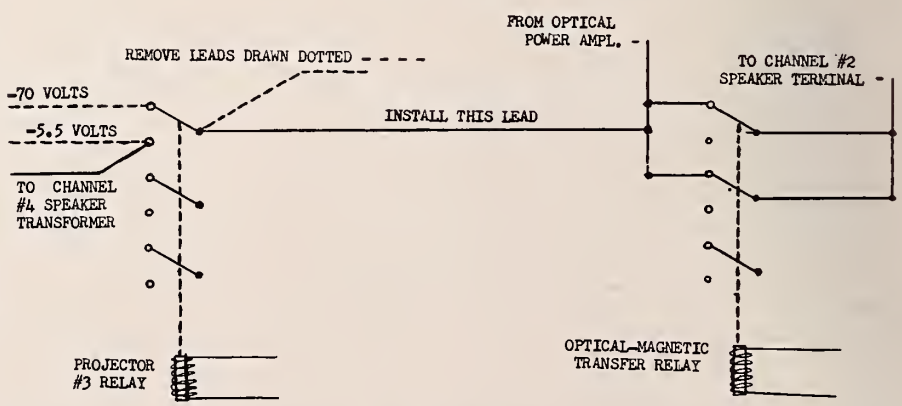
Since the optical-magnetic relay is usually located next to the third projector relay, the optical power amplifier signal is readily available for this conversion scheme.

It is admitted that the output transfer of the optical amplifier must be accomplished before the matching transformer for the auditorium surround speakers is introduced in the circuit. The meticulous will perhaps be disturbed by the fact that the output transformer of the fourth channel magnetic amplifier will be in parallel with the impedance presented by the surround speakers through the associated matching transformer. The advice of the writer to these persons is to forget such matters, inasmuch as the low power level required does not demand attention to maximum energy transfer.

Two-Projector Theatres

It occurs to the writer that there are numerous theatres which do not have three-projector systems. For those theatres, good practice will

(Continued on page 34)



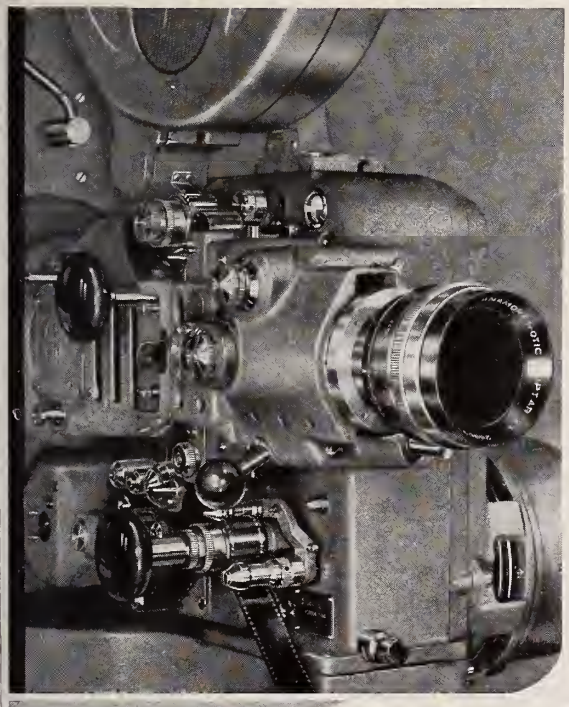
Typical switching reloy modificotion for ploying non-sync sound over surround speokers. Switching and tally wiring ore omitted.

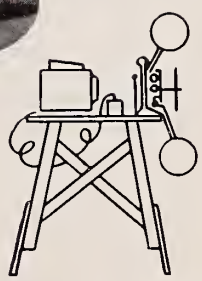
50 YEARS

Kino-Bauer

A half-century of successful endeavour, which at the same time is a digest of the history of Kine-technology: from the first hand-operated projector up to the ultra modern BAUER B 12 equipped for all the latest film projection processes, with photo- and magnetic-track sound-heads – from the first Stuttgart cinemas up to the huge drive in cinema in Pretoria.

50 years of kine-technical experience and the absolute maximum of high-quality manufacture hall-mark the products of the EUGEN BAUER GMBH.





EUGEN BAUER GMBH STUTTGART-UNTERTÜRKHEIM

Cropped Titles Create Problems At Wide-Screen Art Houses

Special adjustments are often needed when a projectionist shows a foreign picture by modern methods.

WITH new highs being set in their attendance figures, many "art" theatres throughout the country are striving to give patrons more for their money by converting to wide screen projection. As a good portion of the films shown at these theatres are foreign releases with superimposed English subtitles, an unusual problem presents itself.

This concerns the clear unobstructed showing of all the English subtitles of a foreign language release. Present wide screen non-anamorphic projection requires an aperture masking arrangement that reduces the film frame in height. When foreign films are shown in this manner the much needed titles at the bottom of the picture would be masked out at the aperture.

Screen Height Increased

Greater title height is therefore necessary for big screen showings of foreign films. The added height needed can be achieved in two different ways. One way is to position the titles higher up on the film negative, so that the present wide-screen masking will not cut them off at the bottom of the picture image. This procedure is now being followed by many American titling houses. Another method is to add extra height to the wide screen itself, a more complicated project, but one recently accomplished at the Plaza Theatre in New York City.

Fortunately, the Plaza Theatre had ample screen space to draw upon. Constructed in 1930, the house was originally equipped with the Magnascope system of variable masking and lenses, permitting variations in screen proportions. Since then a number of different screens and screen sizes have been used, including the RCA Synchro-Screen for several years. The entire front wall of the theatre has always been available and therefore many changes were possible.

When some important foreign releases were scheduled for the Plaza, it became necessary to make changes so that the superimposed English titles would not be cropped off at the aperture for wide-screen showing. No architectural alterations were required for the changeover because the original Magnascope screen masking dimensions of 18 by 31½ feet were still available. There remained only the mechanical task of adjusting the masking and the aperture.

A winch located behind the screen raises the top masking when the added height is needed to include the titles. For wide screen performances of foreign films, a certain amount of framing-up is necessary to allow the lower part of the film image containing the titles to be flashed clearly on the increased height of the screen.

The Plaza's CinemaScope size picture of 31½ by 14½ feet compares with the theatre's ordinary wide-screen picture of 25 by 14½ feet. Screen height is increased another three feet when foreign films are shown on the wide screen by the non-anamorphic method.

A simpler method of solving the "titles" problem is to position them slightly higher on the film frame, so that the wide-screen aperture masking will not cut them out. This is the task of the film laboratories responsible for the translating and etching in of titles, both for domestic products going abroad and foreign products coming in.



An anamorphic lens designed to help bring CinemaScope within the budgets of small neighborhood theatres has been announced by Bousch & Lomb. Priced at $240, or $480 per pair, Bousch & Lomb considers it to be equal in performance to its previous model CinemaScope adopters.

Actual picture image on 35-mm film is 22-mm in width. Prior to wide-screen, the maximum length of each line of titles was 19-mm. A line could contain up to 30 letters of 0.6-mm size letters. The number of lines sometimes went as high as three without seriously affecting the details of the picture.

For wide-screen, however, maximum line length is reduced to 15-mm, so that the audience can still absorb a line at a single glance. Because of the great expansion in wide-screen projection, the size of each letter in a title is only one-third of a millimeter. The total number of letters in a line can go as high as 45.

The most important change is in the height of the titles from the bottom frame line of the film. The height of titles designed for regular projection is 1.5-mm from the bottom of the frame line. For wide-screen projection, this distance is now being doubled, so that titles are three millimeters above the frame line. The added height clears the titles for wide-screen presentation up to a 1.85:1 aspect ratio.

Another important factor is the use of only one line in titles for wide-screen. More than one line would endanger the safe clearance afforded by the raised titles. It has been found that one line is sufficient to communicate the necessary meaning, due to the increased wordage the single lengthened line (45 letters) can carry.

Hint for Projectionists

David Opochinsky, who heads subtitling for the Titra Laboratories in New York, makes the following point to projectionists. While concentrating on proper focusing of the picture image, projectionists tend to minimize focusing on the titles. Because of the visual strain on the audience of continuously reading during the viewing of a picture, he says projectionists should emphasize sharper focusing on the titles. Due to the projection angle in many theatres, focusing will vary slightly from the top of the picture image to the bottom.

Arclamp, Projector Optics Must Match Each Other

It is most important that this vital requirement of efficient wide-screen projection be understood.

RECENTLY IP received a letter from a projectionist who had independently come to the conclusion that the need for matching arclamp and projector lens optics was "so much propaganda." Printed below is the letter, and following that, is a complete description of what actually happens when light passes through a projector optical system. In this day and age, when arclamps must be strained to produce the light needed to project pictures on greatly-enlarged screens, it is particularly important for all projectionists to realize that the line of thinking represented in this letter is misleading.

All elements in a projector optical system must match if even adequate results are to be obtained. The letter is reprinted here because, in answering it, we are provided with the opportunity to review a very important aspect of theatre projection methods and correct possible misunderstanding in the minds of some projectionists.

The letter follows:

I have always maintained that to illustrate the passage of light from the mirror, through the aperture to the lens, and so to the screen, by straight rays or lines is correct *only* when there is no film in the aperture.

Any lens will form an image of any object placed in front of it. The brightness of the reproduced image depending, among other factors, on the brightness of the original object. Or to be more exact, on the degree of illumination of the original object. As far as the lens is concerned it matters not whether illumination is reflected or transmitted.

I have always maintained that the film frame in the aperture becomes an "illuminated object," translucent and giving off light in all directions, and that to the lens, the film frame is the source of light. Therefore, the matter of matching lenses to lamp mirrors is so much propaganda.

The lamp and mirror should be designed solely to illuminate the *film frame* as evenly and as brilliantly as possible, keeping in mind that, to the lens, optimum results are obtained *only* when all light from the lamp is at right angles to the film and parallel to the lens axis. When these conditions obtain, we will then have an evenly illuminated screen regardless of the speed of the lens. Increasing lens speed will increase screen illumination but will not affect evenness of illumination except to a negligible degree.

The writer of the above letter apparently refers to a supposed scattering of light by the film when he questions the linear transmission of light rays. Actually, however, the scattering of light by the film is an insignificantly small factor, and occurs principally in regions of photographic density in silver-image films. Color films, nearly all of which have transparent dye images, do not scatter light at all. This may be proved by drawing back the light-shield between gate door and lens while films are being projected and looking at the aperture. When a black-and-white film is running, the scattered light is almost blinding, but when a Technicolor print is used, the picture over the aperture may be observed comfortably because the dye images scatter so little light.

Film Not Translucent

The idea that the film is "translucent" and "gives off light in all directions" is erroneous. Such a condition could exist only if the film were light-diffusing, like frosted glass or rice paper. "Opaque projection" used for showing postcards and other paper prints by reflected light actually do exhibit the characteristics the writer of the letter attributes to motion-picture projection. (The illumination efficiency of all opaque projectors is notoriously low.) Motion-picture film is definitely transparent, not translucent.

The statement that "as far as the lens is concerned it matters not whether illumination is reflected or transmitted" is also incorrect. It matters in three ways:

(1) The contrast of silver-image (black-and-white) pictures is greater in transmitted-light, or "specular," projection than in reflected-light, or "diffuse," projection, the specular densities being 25% to 35% higher than the corresponding diffuse densities.

(2) Distribution of illumination on the screen is influenced to a profound extent by the distribution of brightness in the light-source and by the characteristics of the lamp optics in specular projection. These are not significant factors in diffuse projection, which requires only that the object (opaque photograph) be uniformly illuminated by any means — even by a bare light-bulb without condensing lenses.

(3) Certain projection-lens errors,

(Continued on page 31)



You want to see the Chief, little white man? (The English take their titles seriously, including the boss of the projection room.)

Ideal Kinema, London

Color and Its Reproduction on Film

By ROBERT A. MITCHELL

The use of color is probably the most important technical requirement of today's motion picture production. The second installment of this timely article probes beneath the trademarks and provides projectionists with a description of the formidable problems involved in reproducing a natural color record of a scene on film.

THE REPRODUCTION of pictures in natural color, whether still photographs, motion pictures, or televised images, involves *separation* of the colors of the photographed or televised scene into three primary-color "records" and subsequent combination of the three color records to re-create the original scene in full, natural-looking color.

The use of three — and only three — primary components is based upon the interesting fact that human color vision is *trichromatic*. Our eyes perceive only blueviolet, green, and red light in various proportions, all the other colors — even white and the "hueless' grays — being *additive mixtures* of these three primary hues. The use of more than three primaries in color reproduction is therefore unnecessary; the use of only two severely restricts the "gamut" or range of color in the reproduced pictures.

The earliest methods of reproducing photographs in truly natural color were additive. The Lumiere Autochrome process for lantern slides and the Keller-Dorian lenticulated-film process for home movies are noteworthy examples of additive color reproduction. But the simplest and most satisfactory additive process requires a split-beam color camera and either a special projector or three identical simple projectors for showing the pictures. Let's see how this process works.

Beam Splitter Used

The light entering the camera through the lens is split by a special arrangement to give three identical images of the photographed scene. These are focused upon three black-and-white negative films. Over one film is placed a blueviolet filter, over the second a green filter, and over the third a red filter. Each of the three films thus records approximately one-third of the spectrum.

Taking the pictures is one thing; exhibiting them in full color is quite another. Black-and-white prints made from the three black-and-white color-record negatives may be superimposed on a screen by using three projectors. If this method is used, a color filter is interposed in the light-beam of each projector. The print made from the blueviolet record is thus projected by blueviolet light, and similarly for the prints made from the green and red records. When accurately registered on the screen, the three colored-light pictures combine additively to reproduce the scene in all its original chromatic beauty.

Additive color projection makes possible more faithful color rendition than any other method — even better than any process used by the motion-picture industry today, good as modern color movies are. But there is a "catch" to this beautiful method. It is so wasteful of light that it cannot be used for large-screen projection!

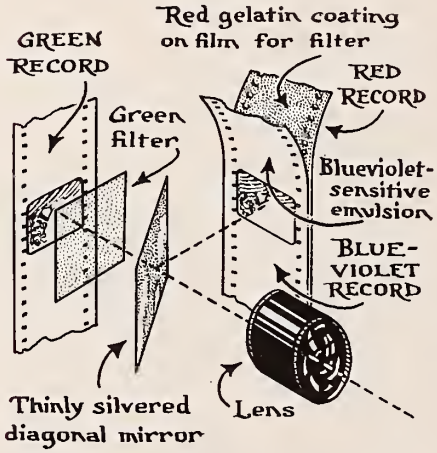


FIG. 1. Natural-color photography by the separation-negative method. Three black-and-white negative films are used. A thinly silvered (gold-sputtered) mirror behind the lens causes two identical images of the scene to be formed. One image is focused upon a film in front of which a green filter is placed. This film becomes the "green record." The second image is focused upon a bipack of two films running together emulsion to emulsion. The first of these two films is sensitive only to blue-violet light, and accordingly constitutes the "blueviolet record." The second film has a thin coating of red gelatin to filter out all colors except red. This film is the "red record."

If the primary-color filters pass only narrow spectral regions for the most nearly perfect color reproduction, even as much as nine-tenths of the light-output of the three projectors may be absorbed. The use of lightly tinted, or broad-band, filters results in a noticeable loss of color "saturation" though the picture is brighter.

High-Quality Results

Nevertheless, so attractive is the additive process of projecting motion pictures in color that several methods of adapting it to standard 1-strip projection equipment have been devised, eliminating the need for three synchronized machines. The Keller-Dorian process, widely used until 1932 in the 16-mm field, is one such method.

This process employs black-and-white film, the celluloid side of which is embossed with innumerable curved ridges which function as tiny cylindrical lenses. This "lenticulated" film is threaded up in both camera and projector with the celluloid side facing the lens.

To use the lenticulated film, a special tricolor filter is placed over the camera lens. The filter consists of three strips of gelatin placed side by side, blueviolet, green, and red. The filter bands are focused upon the film emulsion by the lenticulation, forming three tiny latent-color bands behind each lenticulation. Each point in the photographed scene accordingly reproduces a very short line-image on the film, the line being transverse to the direction of the lenticulations.

The developed film is a black-and-white photographic record of the scene split up into latent primary-color components arranged as a series of microscopic strips. A tricolor filter similar to the one used in photography is placed over the projector lens to show

the film in natural color.

The outstanding advantage of the Keller-Dorian process is the use of relatively inexpensive monochrome film which is developed and printed in black-and-white. But the faults of this additive method are many. (1) Imperfections in the lenticulations and variations in base thickness due to shrinkage spoil the color. (2) From two-thirds to 95 per cent of the projection light is absorbed and wasted by the filters, depending upon their chromatic and transmission characteristics. (3) Parallax effects in photography produce color fringes on the edges of out-of-focus objects. (4) Loss of definition and color when negatives are printed. (5) Dirt and oil adhering to the film between the lenticulations degrade the color. (6) Scratches on the film and abrasions of the lenticulations produce spurious colors.

Thomascolor

In the Thomascolor and Roux-color additive processes, the scene is split into three identical images and reduced in size so that the three fit into the space of a single regular 35-mm frame. (Space for a fourth image is left blank.) The optical beam-splitting arrangement, an integral part of the camera lens, contains the requisite blueviolet, green, and red color filters.

Ordinary black-and-white negative is used in the camera. Prints are also monochrome; and although the tiny frames of each set are black-and-white images, differences in the densities of corresponding images constitute latent color values. An orange object, for example, is black in the "blueviolet frame," gray in the "green frame," and white in the "red frame."

Projection of Thomascolor films is simple: a special lens containing color filters re-combines the three images on the screen to give a picture in full natural color. Each diminutive frame is projected in the same primary color as was used in photography. Although this process obviates many of the faults of the lenticulated-film process and gives much clearer pictures, it offers no improvement lightwise. Thomascolor and Roux-color pictures are very dim on large theatre screens, but the color is beautiful.

To get brilliant full-color movies, therefore, *subtractive* color prints must be used. These are the natural-color prints familiar to all projectionists; and because the pictures on the film are colored, such prints are projected in the same way as standard black-and-white prints.

Eastman Color, Ansco Color, Technicolor, Agfacolor, Gevacolor, Ferraniacolor, Pathecolor, and Sovcolor prints are representative of this class. They are termed "subtractive" because the colored dyes used for printing the full-color images subtract primary color-components from the white light of the projection lamp.

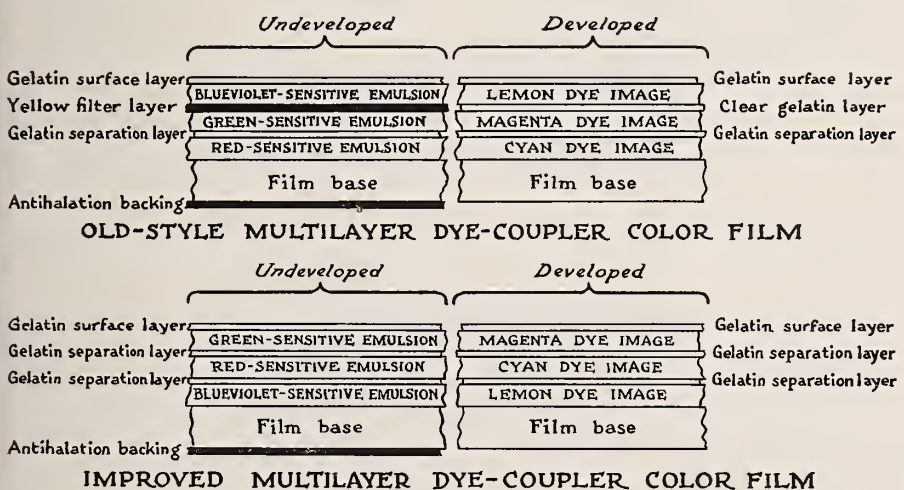


FIG. 2. Arrangement of the three color-sensitive emulsions in multilayer dye-coupler color films — films having the color "built in." In both the old and the new types, each layer is designed to record the scene by the light of only one primary color. Each photographic record is subsequently processed to give an image in the reciprocal color complementary to the primary. The superposition of the three reciprocal-color images in the positive print reproduces the original scene in full color. Note that blue-violet light is screened from the green- and red-sensitive layers of the older type of multilayer color film by a yellow filter layer (removed in processing). The new type of film, having a more satisfactory placement of the three emulsions, dispenses with the need for a filter layer by special photographic sensitization of each layer to the light of just one primary spectral band.

Subtractive Color Theory

The "theory" of subtractive color formation as applied to the superposition of three dye images on motion-picture film is not too hard to understand. The basic idea is simply this: each of the three dyes absorbs the primary color used in photographing the particular color record it reproduces. The remaining two primaries are transmitted by the dye. The selective absorptions of the three superposed dye images result in a reproduction of the colors originally photographed.

In hue the subtractive printing dyes are the *reciprocals*, the complementaries of the primaries. The complementary of blueviolet is lemon. When the image photographed through a blueviolet filter is printed on the projection film in lemon dye, the printed image absorbs all the blueviolet component of the projection light wherever black *or some color other than a blueviolet-containing one* was present in the original scene. So with the other two colors: the green record is printed in magenta for selective absorption of green light, and the red record is printed in cyan for the selective absorption of red light.

The combination of various densities of lemon, magenta, and cyan subtracts from the white projection light the exact complementary of the color of the object photographed, transmitting to the screen the original color.

To make the matter clearer let's consider what happens when a blue object, such as azure-blue sky, is photographed. The blueviolet record registers the sky as a white object, the green record registers it as a light gray object, and the red record as a black object.

The L image (printed from the B record) will accordingly be clear white in the sky areas of the finished print. The M image (from the G record) will have a pale magenta, or lavender-pink, sky. The C image (from the R record) will contain a strong cyan, or greenish blue, sky. The subtractive combination of light magenta and saturated cyan is azure-blue.

How do we know this? Using the "B-G-R" color-specification system, the process of photographing and sub-

tractively reproducing an azure-blue object can be worked out with mathematical exactitude.

1. PHOTOGRAPHY OF AZURE-BLUE SKY:

Object:	100	-	50	-	0 Azure-blue.
	↓		↓		↓
B record:	100	-	0	-	0 Bluevialet.
G record:	0	-	50	-	0 Dark green.
R record:	0	-	0	-	0 Black.

2. CORRESPONDING DYE-IMAGE DENSITIES:

B record:	100	-	0	-	0 Bluevialet.
	+		+		+
L dye:	0	-	100	-	100 Lemon.
L image:	100	-	100	-	100 White.
G record:	0	-	50	-	0 Dark green.
	+		+		+
M dye:	100	-	0	-	100 Magenta.
M image:	100	-	50	-	100 Pale magenta.
R record:	0	-	0	-	0 Black.
	+		+		+
C dye:	100	-	100	-	0 Cyan.
C image:	100	-	100	-	0 Cyan.

3. RESULTANT COLOR SUBTRACTION:

L image:	100	-	100	-	100 White.
	X		X		X
M image:	100	-	50	-	100 Pale magenta.
	X		X		X
C image:	100	-	100	-	0 Cyan.
Reproduction:					
	100	-	50	-	0 Azure-blue.

There are two commonly used methods of photographing motion pictures in full color: (1) the use of three black-and-white negatives in a split-beam color camera, as shown in Fig. 1, and (2) the use of multilayer dye-coupler color film in an ordinary motion-picture camera, as shown in Fig. 2. There are also two commercial methods of manufacturing subtractive 3-color film prints: (1) dye-imbibition and transfer to plain gelatin-coated stock, and (2) dye-formation in multilayer color film.

Multilayer dye-coupler film is favored by the industry at the present time for both taking the pictures and making the release positives. Although separation-negative cameras are bulky and expensive, it is nevertheless true that better color results can be obtained by their use than are possible with multilayer color negative. As for prints, multilayer color film is superior. It gives prints in color as clear as ordinary black-and-white prints, and it has a wider latitude than the imbibition process. Imbibition color prints are not nearly as good for clear widescreen and CinemaScope pictures.

But whatever methods are employed in any specific "system," the color engineer can insure good natural color on the theatre screen only by carefully manipulating the characteristics of the process all the way from the taking of the negatives down to the preparation of the projection prints. Among the many problems to be resolved are the overall color "gamut" or range of the system, adjustment of "color temperature" in photography and color balance in film processing, photographic latitude as related to the "linearity" of the blueviolet, green, and red records, and the contrast and density factors of the three records in both photography and film processing.

The "gamut" of a color-reproduction system is a matter of prime importance. Not only must the color camera-negative combination be capable of recording the full range of color visible to the human eye, but the printing process (which necessarily involves the use of dyes at best imperfect) must preserve the chromatic fidelity of the color negatives.

The gamuts of color-reproduction systems are best plotted on a "chromaticity triangle." The chromatic limitations of the various systems then appear at once and are easy to evaluate.

Figure 3 shows how to draw such a triangle. An equilateral (equal-sided) triangle is constructed, and the three corners marked as the points at which the primary hues (blue-violet, green, and red) occur. The "hueless center" of the triangle is the point where *white* in additive color mixtures, and *black* in subtractive color mixtures, is located.

The midpoints of the three sides of the triangle are where the reciprocal hues are placed. Because the reciprocals are the complementaries of the primaries, a line drawn from any primary through the hueless center will, if extended, intersect the opposite side of the triangle at its midpoint.

In order that a line drawn from *any* hue through the hueless center will reach the *exact complementary* of that hue, it is necessary to mark the hue divisions on the sides of the triangle in a special way. The triangle is circumscribed, and equal divisions plotted on the circle. The divisions so made, extended toward the common center of both triangle and circle, result in a non-uniform spacing of the intersections on the sides of the triangle, fulfilling the requirements exactly.

Designating Color Exactly

As Fig. 3 shows, the various hues are designated, not by wavelengths, but by *trichromatic specifications* — in this case in 20-unit steps, making a total of 30 hue steps. These steps don't happen to correspond to equal sensation differences, of course, but

(Continued on page 24)

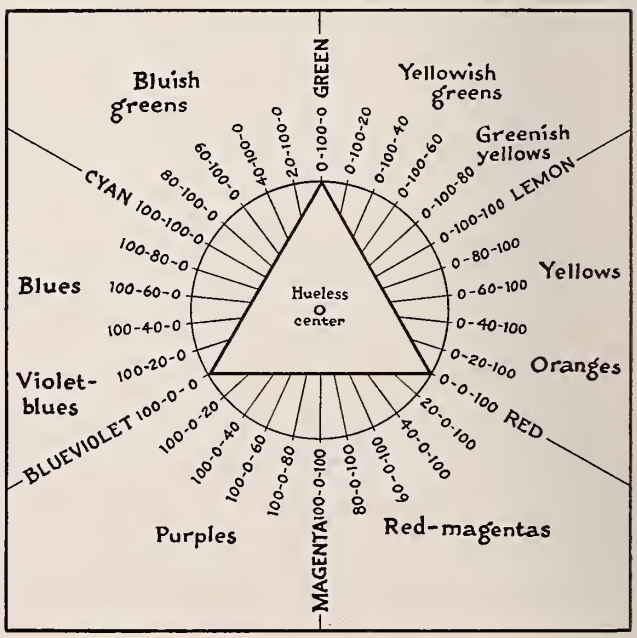


FIG. 3. Derivation of the chromaticity triangle. In order that a line drawn from any hue to its complementary pass through the exact center of the triangle, the hues are plotted on a circle according to equal steps of trichromatic specification — in this case, 20-unit steps. This expedient results in a "spreading-out" of the hue steps toward the corners of the triangle.

1945 to 1955: Ten Years of Projection Advances

This is the conclusion of a two-part article that sums up post-war developments in the film theatre.

THE ADVENT of CinemaScope inspired attempts to produce a CinemaScope-like picture by cropping the height of the standard, non-anamorphic picture and enlarging the resulting frame on wide screens by means of short-focus lenses. This type of projection is called "widescreen" to distinguish it from both the standard 1.375/1 aspect ratio and from the CinemaScope anamorphic process.

Widescreen projection has been the source of many complaints of inadequate screen illumination and poor focus.

The blurriness often noticed in widescreen projection is due to the natural effect of excessive image-magnification and the increased prominence of film-flutter in the projector gate. While the optical efficiency of any projector fitted with a widescreen aperture is necessarily low, recent improvements in projection lenses make possible widescreen pictures which are at least as clear as normal pictures projected with old-style lenses. The newer lenses, being coated and better designed, give sharper, "flatter," and more brilliant images with improved contrast characteristics.

Fine-Grain Developers

The photographic images on 35-mm release prints attained a state of exceptionally high clarity in the late 1920's when fine-grain negative emulsions and developing agents were perfected. Slower laboratory procedures were standard in the days of silent films, and the painstaking hand-development of negatives, masters, and dupes resulted in beautiful work. The soundtrack, however, demanded machine processing, and the rigid requirements of photographic gamma required by sound banished beauty from the screen in the opinion of some perceptive critics of motion picture technology.

The careless preparation of duplicate negatives and the operation of obsolete printing machines at high speeds to fill increasingly large print orders militated against good image definition as time went on. Periodic "low-key" fads with the photographic density supplied by the printer lights were also responsible for the poor picture quality frequently seen in the 1930's and 40's.

Many of the older prints would be wholly inadequate for widescreen projection. Even the better prints—the ones which look clear on small, conventional screens—would appear rather "fuzzy" on the larger screens in use today. All studios have recognized this fact, and, accordingly, efforts have been applied to the end that the picture on the film have utmost clarity. More careful preparation of intermediate films and release prints has helped considerably. But improvement in this direction is ultimately limited by the relatively coarse grain of the original camera negatives.

VistaVision

In order to correct this deficiency of standard motion-picture photography, Paramount Pictures now utilizes a double-frame negative image, with the film running through the camera horizontally. The large negative frames are subsequently reduced and reoriented in the standard position by means of a special optical printer. This is called the VistaVision process, and its merit lies in reducing the size of the negative grain to give clearer pictures in the print.

The advantages of the VistaVision process are fully realized when black-and-white film and the dye-coupler type of color film are used. The clarity gained by reducing the oversize negative picture is, on the other hand, partly lost when the release prints are made by the older method of dye-imbibition. It is interesting to note that 20th Century-Fox has decided on the use of wide film for photography, with subsequent compression of the image for CinemaScope release prints. This process will undoubtedly prove very successful.

Most projectionists are rather glad that duplitzed color prints of the 2-color type (a red-image emulsion on one side of the film, green-blue on the other) have gradually disappeared from the theatre field during the past eight years. Not only was the color rendition by films of this type very poor, but the physical separation of the two emulsions made them rather difficult to focus sharply. Splicing the double-coated stock was also a nuissance.

A non-cellulose release print base designated by the du Pont trade-name "Cronar" is soon to be released to the trade if field tests now in progress give favorable results. Cronar film is said to be much stronger and more resistant to wear than either cellulose nitrate or triacetate films.

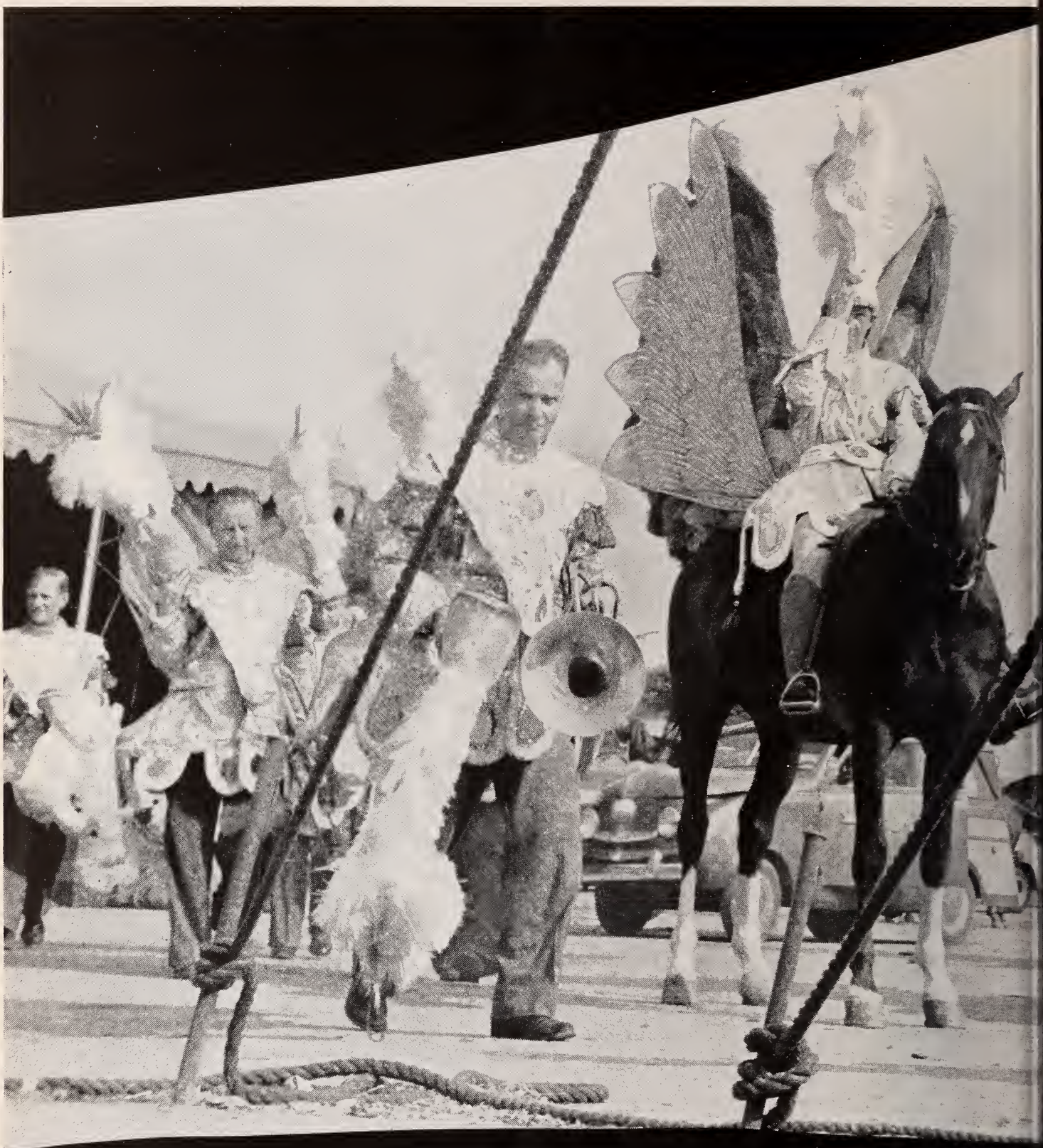
Unlike the cellulose-base film stocks, Cronar is resistant to all known solvents suitable for film-cementing purposes, and must be patched with a special plastic adhesive tape perforated like the film. These patches are said to be strong.

Like triacetate safety film, Cronar burns only with difficulty, but unlike any type of film heretofore used in professional motion-picture projection, Cronar is much thinner, a regular 2000-foot spool holding 2,700 feet of emulsion-coated Cronar film.

Some industry spokesmen are of the opinion that any film which cannot be spliced in the regular manner is *ipso facto* unsuitable for general theatre-release use, while the distribution front is directing a watchful eye toward the possible cost of Cronar. It is rumored that Cronar will cost no more than triacetate film.



Reproduction of an ingenious Xmas greeting card designed by Ray Brian, member of Local 434, Peoria, Ill. Brian is familiar to readers of IP for his extensive collection of data on projector mechanisms.



Greatest Show on Earth . . .

Every week—everywhere—spectacle fallaws spectacle across the wide, wide screen. Figures, actian—near life in size—have new "claseness."

Street scenes, sports, wonders of nature—all "live" and "breathe" with reality.

New, changing technics of production, processing and projectian make all this passible . . . technics which Eastman Technical Service for Motion Picture Film is p ta wark with the industry in solving. Branches at strat centers. Inquiries invited.

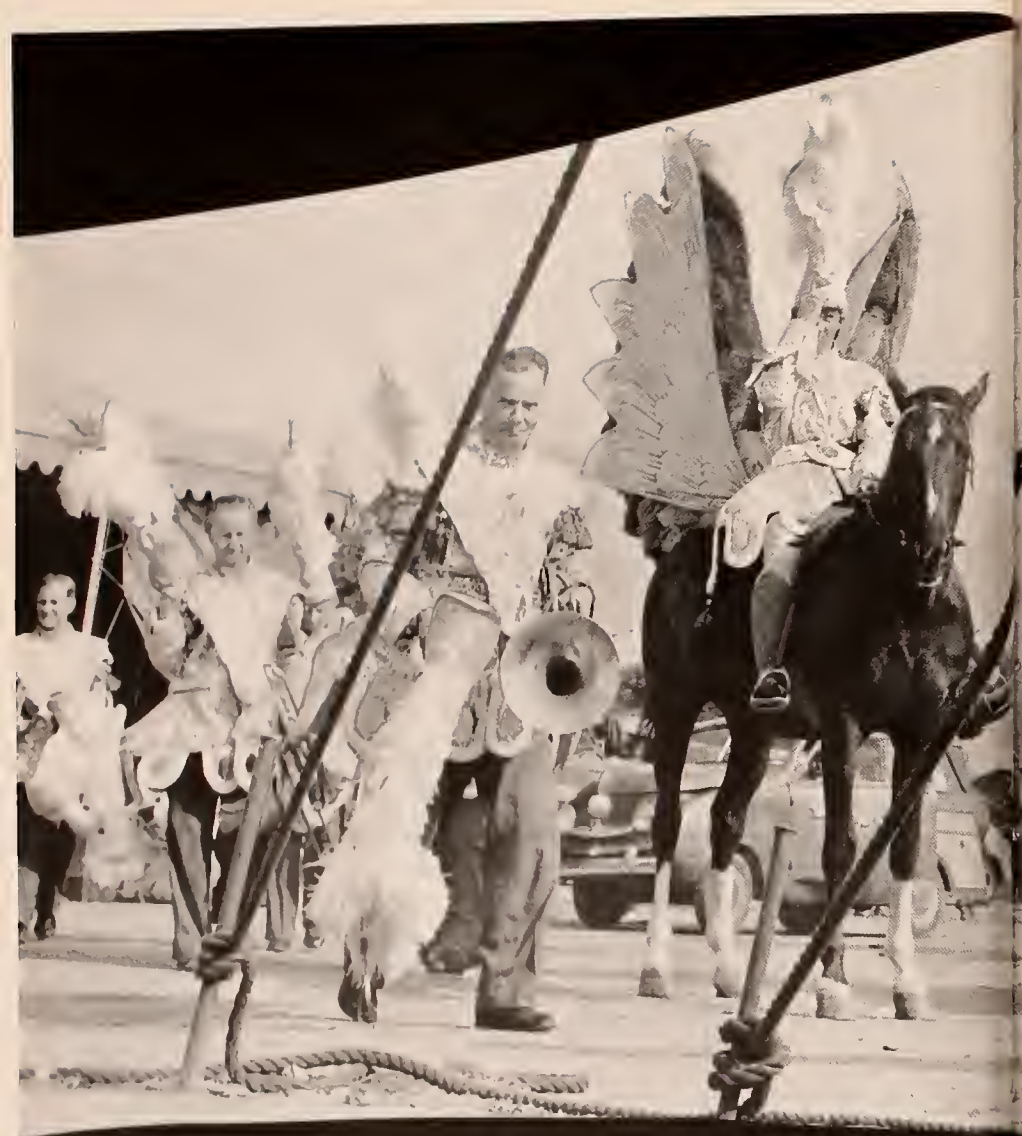
Address: Motion Picture Film Department
EASTMAN KODAK COMPANY, Rochester 4, N



East Coast Division
342 Madison Ave., New York 17, N. Y.

Midwest Division
137 North Wabash Ave., Chicago 2, Illinois

West Coast Division
6706 Santa Monica Blvd., Hollywood 38, California



Greatest Show on Earth . . .

Every week—everywhere—spectacle follows spectacle across the wide, wide screen. Figures, action—near life in size—have new "closeness."

Street scenes, sports, wonders of nature—all "live" and "breathe" with reality.

New, changing technics of production, processing and projection make all this possible . . . technics which Eastman Technical Service for Motion Picture Film is pr to work with the industry in solving. Branches at strat centers. Inquiries invited.

Address: Motion Picture Film Department
EASTMAN KODAK COMPANY, Rochester 4, N.

East Coast Division
342 Madison Ave., New York 17, N. Y.

Midwest Division
137 North Wabash Ave., Chicago 2, Illinois

West Coast Division
6706 Santa Monica Blvd., Hollywood 38, California

In The

SPOTLIGHT

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

WE WISH to extend our appreciation for the many beautiful Holiday cards we received from our many friends from all parts of the world. It would be physically impossible for us to personally acknowledge each of the cards, and we take this means to thank our readers for their good wishes.

• The IA General Executive Board will hold its regular mid-winter meeting at the Hollywood-Roosevelt Hotel, Hollywood, Calif., the week beginning January 30.

• Health and welfare plans have become an integral part of all contracts negotiated by officials of Local 159, Portland, Ore. The first contracts containing these benefits were signed last May when existing agreements with first-run houses in Portland were up for renewal. Among other benefits contained in the new pacts were a wage scale of $4.50 per hour, pay for one-half hour daily maintenance time, and vacations with pay. Similar benefits are to be incorporated in all contracts signed with the independent houses as they come up for renewal. In the December issue of the District No. 1 Quarterly Bulletin, Herb Kurasch, who participated in the negotiations last May, gives an interesting detailed account of the highlights of the Local's health and welfare program which may serve as a guide to those Locals seeking to inaugurate similar benefits for their members.

• Knighthood was recently conferred upon Tom O'Brien, veteran British labor leader and general secretary of the National Association of Theatrical and Kine Employes (NATKE), the equivalent of our IATSE. Sir Tom O'Brien is no stranger to the motion picture industry in this country, having visited the U. S. on a number of occasions. He was an honored guest at the IA Convention in Cleveland in 1948 where he made one of the principal addresses. He has been a member of Parliament since 1945, representing the city of Nottingham in Commons.

• Introduced by the IATSE at the recent first convention of the merged AFL-CIO, a resolution denouncing toll Tv as "an infringement on the property right now enjoyed by the general public on a no fee basis," was unanimously adopted. The resolution calls upon the officers of the AFL-CIO to acquaint the FCC with labor's united opposition to toll Tv. (See IP for July, 1955, p. 22. "*This Business of Toll-Tv.*")

BROTHERS UNDER THE SKIN



Photo by Alexander Archer

AFL-CIO President George Meany (left) and two of the 27 recently elected vice-presidents of the merged labor unions: IA President Richard F. Walsh and President Walter P. Reuther of the Auto Workers Union.

• IA President Walsh has been appointed to serve on the committees on civil rights and international affairs for the combined AFL-CIO.

• Christmas parties for underprivileged children and hospital shutins have become a "must" with many Locals throughout the Alliance. Members of these Locals donate their services in providing entertainment for these unfortunates and in many instances also give financial assistance where needed. For instance, Ralph Frazier, business representative for Boston Local 182, recently started the first annual Christmas party to be sponsored by the Local. In cooperation with the Boston police department, Frazier and the members of 182 arranged for a series of free screenings for needy children. These screenings were held at the five film exchanges in Boston's film-

CHATTANOOGA LOCAL 259 HOLDS BANQUET IN CELEBRATION OF ITS 45th ANNIVERSARY



Pictured here are members and guests of Chattanooga Local 259 as they gathered around the festive board in observance of the Local's recent 45th anniversary. IA President Richard F. Walsh headed the list of honored guests in attendance, which included many top International officials and industry notables.

row. A police officer dressed as Santa Clause was stationed at each exchange and distributed toys, candy and ice cream.

Here in New York, Harry Garfman, Brooklyn business representative for Local 306, has been playing Santa Claus to the inmates of St. Giles and Beth-El Hospitals in Brooklyn for a number of years. In conjunction with the Movie Social Club of Kings County (comprised of 306 members), Garfman each year distributes toys and candy to the bedridden youngsters of these institutions, in addition to providing them with a program of entertainment.

MOVIE SOCIAL CLUB (LOCAL 306) PLAYS SANTA CLAUS



Harry Garfman (secand from left), and members af the Mavie Social Club of Kings County (Lacal 306) distribute gifts at the Club's annual Christmas party to the children at the Beth-El Hospital clinic in Braaklyn, N. Y.

• H. F. Simonson, member of and legal adviser for Local 482, Champaign. Ill., was recently presented with a gold life membership card in appreciation for outstanding services rendered the Local and its members over a period of many years. Simonson began his career as motion picture projectionist in Chicago, back in 1916, later moving to Champaign where he entered the University of Illinois College of Law. He worked as a full time projectionist while he attended the University, and in 1923 he became a full-fledged member of Local 482, later serving as business representative and as delegate to various union conventions. He has been the Local's attorney since his graduation from the University in 1927.

The presentation took place at a surprise dinner tendered in his honor at the Quality Cafe in Champaign, with many union and civic notables present. LeRoy Upton, IA representative, made the presentation on behalf of the union officials.

CHAMPAIGN IA LOCAL HONORS ATTORNEY FOR LOYAL SERVICES



H. F. Simansan (third from right), well-knawn attarney and member and legal adviser far Lacal 482, Champaign, Ill., is shown being presented with a gold life membership card in the union. Witnessing the presentatian are, left to right: Clean Fax, P. A. Wills, members of the Lacal; S. C. Janes, Twin City Federation of Labor; Mayor Virgil F. Lafferty; Simonson; IA Representative LeRoy Upton who made the presentation; and Dale Mellinger, Local 482.



Graup picture af Local 482 members as they gathered to pay honor to Simansan: Front row, left ta right: Jack Crannell, Jr., Cloen Fox, P. A. Wills, G. R. Mann, J. C. Daugherty, and E. L. Webb. Back row, left to right: Frank Schaeffer, Garrett Leffler, Creed Wills, Robert Dalhaus, Jack Crannell, Sr., Fred Struth, D. G. Miller, Simanson, Dale Mellinger, Albert Bothfuhr, LeRay Upton, (IA representative), Richard Klemm, and Robert L. Gordon, Jr. Standing: Owen Marshall.

• Scheduled to become effective January 1, 1960, retirement benefits for West Coast studio workers included in the Motion Picture Industry Pension Plan were increased from $20 to $50 per month. The increase in benefits was made possible by the new collective bargaining contracts recently signed which raised the amount paid into the pension fund by employers from two to six cents per hour, and by employes from two to four cents hourly. Employes of M-G-M, RKO, and 20th Century-Fox are not included in this boost since they participate in company-sponsored plans.

SMPTE Convention Dates

John G. Frayne, president of the Society of Motion Picture and Television Engineers, announced that convention dates and places have been set up to and including the 100th meeting in the fall of 1966. The scene of the next SMPTE convention will be the Hotel Statler in New York City, April 29—May 4, 1956.

The convention schedule follows a two-a-year pattern, Spring and Fall, with the meetings held in different parts of the country. The 1956 Fall meeting, Oct. 7-12, will be held at the Ambassador Hotel in Los Angeles.

LETTERS TO THE EDITOR

An Invitation to Visit Arizona

(The November issue of this department carried a letter from Albert Powers, of Ashland, Kansas, who confessed that he was puzzled about complaints against poorly-focused pictures at many theatres in his area. He was puzzled, he said, because he never had any difficulty focusing CinemaScope or wide-screen pictures. Mr. Powers added, however, that his theatre had a 100-foot throw for a picture 23½ feet wide, and that his lenses were 4 inches focal length and f/2. The following letter is in reply.)

To the Editor of IP:

Referring to a letter to the Editor of IP from Albert Powers, of Ashland, Kansas in your November issue, I wish to state that Mr. Powers can consider himself very fortunate in having a smooth projection set-up compared with some other theatres he has heard about. There are theatres where it is almost impossible to keep a CinemaScope or wide-screen picture in focus.

I wonder if he would be proud of his screen if his apertures were 68 feet from the screen, a curved screen with a CinemaScope picture over 29 feet wide and a projection angle of 13 degrees. I have never measured the wide-screen picture. Without masking, it is a trapezium, if I remember my geometry—no two sides or angles equal or parallel. The lens we once used for wide-screen was 2¼ inches focal length and really terrible.

This theatre was an opera house at one time. The auditorium is 69 feet long and 60 feet wide, with first and second balconies. The projection room is an appendix suspended from the heavy roof bridging.

If Mr. Powers wants to take a first-hand look at a present-day projectionist's nightmare, he can take a week off when the weather is nice and play with this one. He is only two daylight driving days from here. Just go over to Meade and take Highway 54 down to Tucumcari, then take 66 to Flagstaff, Arizona. There you can take 89A just this side of Flagstaff and come down through Oak Creek Canyon where a great many of the better outdoor colored pictures have been taken, movies like "Billy the Kid," "California," "Drum Beat," "Broken Arrow," "Johnny Guitar," "Stranger on Horseback," "Shotgun" and many others. If you don't like grades and mountain roads, you can stay on Route 66 until you are almost to Ashfork and take 89 on down.

C. D. Born

Prescott, Arizona

Comment: Projectionist Born's theatre is by no means the only "projectionist's nightmare" that Projectionist Powers can visit. We can name dozens of such theatres where projectionists have worked with feelings similar to those expressed by Mr. Born. All of us know the fatal combination: short throw, large screen, and excessively steep projection angle. That's a recipe guaranteed to sabotage even the most carefully photographed films. But, after all, we can't rebuild the theatre. Perhaps even the owner can't do that!

What can *you* do? Make the best of a difficult situation by talking the exhibitor into decreasing the size of his screen and purchasing lamps and lenses of the best quality. As Mr. Born knows well, we can do worse than describe to the reluctant exhibitor what the picture will look like if lenses of *poor* quality are used!

Some of the fellows tilt the screen back from the top about 5 degrees to minimize the keystone effect. But if the screen is curved, the distortion problem is still far from solved.

Lenses of short focal length (under 4 inches) demand constant attention from the projectionist. Each reel must be checked several times while running to insure a really sharp picture on the screen. Focus drift is a normal occurrence, but short-focus lenses exaggerate it. Remember that the folks in the front rows are more annoyed by fuzzy focus than by any other projection defect. The print may be at fault, and often is; but we can do no more than our very best—and no less!

Telescope Helpful

A low-power telescope such as the Simplex Screen Scope (included with the XL mechanism) is a necessity in these days of CinemaScope and wide-screen pictures. Every projectionist lucky enough to possess this accessory (or the Kollmorgen Scope, which may be purchased separately) considers this optical assistance indispensable to the practice of his craft. Isn't this proof that perfection is the "occupational disease" of movie projection?

Theatres which are unsatisfactory projection-wise literally pepper the country from Maine to California—but that well-known fact shouldn't deter Projectionist Powers from accepting an invitation to a "nightmare" in Prescott, Arizona. Aside from the gorgeous scenery and delicious air of Arizona, the advantages of meeting brother projectionists and examining different projection installations at close range are exactly what we have enjoined upon all our projectionist readers for many years.

Eidophor Delayed

The appearance of big-screen closed-circuit color Tv in theatres, via 20th-Fox's Eidophor system, is still some time away. The equipment itself is nearly ready, although still undergoing improvements by General Electric. However, 20th-Fox is now busy with its new 55-mm CinemaScope negative. When the time comes, the Eidophor system will be brought in with a mighty splash.

General Electric foresees a greater market for Eidophor outside the motion picture theatre field.

WESTREX MANAGERS ATTEND NEW YORK CONFERENCE



Managers from 14 Westrex Corp. subsidiaries in Europe, Asia, Australasia, and Latin America attended two weeks of conferences in New York recently. E. S. Gregg (fifth from left), president of Westrex, describes the new transmission components which are part of the recently designed sound reproducing equipment. Westrex managers shown above are, left to right: M. A. Galdrick, Japan; B. S Rundle, New Zealand; A. R. Schwartz, India; P. W. Kayser, Panama; Gregg; J. P. Winter, France; D. Van Spankeren, Indonesia; F. De Renzis, Italy; Dr. J. G. Frayne, engineering manager of the company's Hollywood Division; J. L. Mannerot-Dumaine, Spain; F. C. Hayes, Mexico; J. G. Van Erk, Switzerland; G. F. Van Weyenbergh, Belgium; M. Prado, Peru; W. S. Tower, Jr., England; J. Sanchez, Equador.

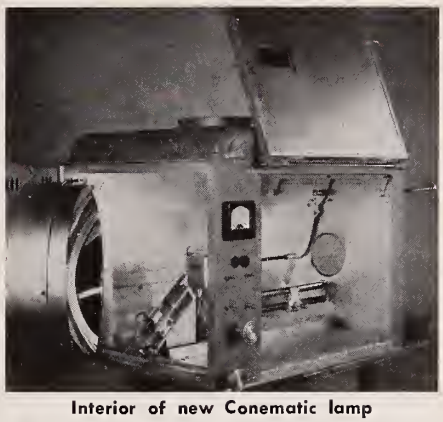
Conematic Arc Has Photocell Control

A new high-intensity 70-140 ampere arclamp is now available. Known as the Conematic, it is manufactured by the Murch Electric Co., of Franklin, Maine, and distributed by "Doc" Faige and Assoc., of New York City. One of its principal features is a photoelectric cell system of arc gap control.

The uncoated positive carbon rotates as it feeds, and the copper-coated negative is inclined at an angle of 40 degress. There can be no slippage of the carbon feed, the manufacturer states, because the positive carbon is held firm in its holder while the entire clamp is rotated by means of a chain and sprocket assembly which also rotates the positive feed screw pusher mechanism.

The Murch Electric Co. reports a light output of 20,000 lumens for the Conematic lamp with the standard soundfilm aperture and *f*/1.9 lens, burning a 9-mm black positive carbon with a 5/16th-inch coated negative, in the 75-80 ampere range. With 10-mm and 11-mm positive carbons, drawing 135 amperes and using an 18-inch reflector, the lamp is said to meet the light requirements of the largest screens. The reflectors used are 16½ and 18 inches in diameter, working at geometric speeds of *f*/1.9 and *f*/1.7 respectively.

The chief feature of the new lamp is the photoelectric arc-feeding and crater-positioning mechanism, which is said to maintain the positive crater in exact alignment with the reflector and prevent movement away from tolerated limits.



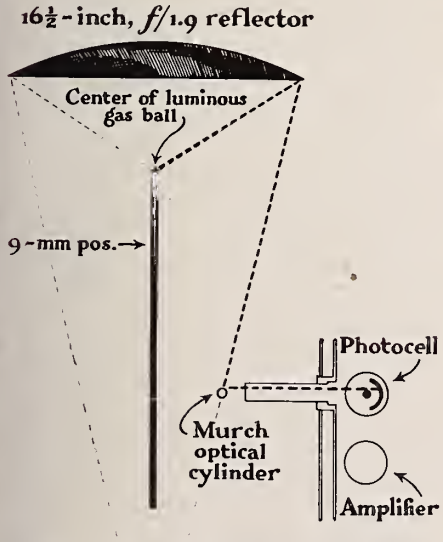
Interior of new Conematic lamp

The photoelectric arc control mechanism works in the following way: When the lamp is operating, a beam passes from the center of the positive crater to the edge of the reflector mirror, and then to a small cylindrical mirror made of stainless steel with a semi-diffusive surface. This optical cylinder intercepts the edge of the beam and reflects the light to a photocell at the side of the lamphouse. The photocell is of the standard ceasium type used for sound reproduction.

How Arc Control Operates

Should the positive crater advance toward the mirror, the beam of light reflected by the mirror becomes slightly wider and results in stronger illumination of the photocell. This causes the feed motor to slow down until the crater burns back to the point of correct geometric focus. Conversely, if the crater recedes from the mirror, the photocell gets less light because the beam has been slightly diminished in diameter. The photocell then speeds up the motor and restores the crater to its proper focal position.

In addition, the interior of the lamp is said to be of roomy and simple design for ease of cleaning. A separately-powered blower is built into the lamp to maintain low operating temperature and to insure complete removal of gas.



Principle of the photocell arc-gap control used in the Conematic lamp. A small cylindrical reflector catches the edge of the beam from the mirror and deflects it to the photocell shown at right. Changes in the intensity of illumination are therefore registered by the photocell. The photocell signal automatically speeds up or slows down the positive drive motor so that the positive carbon crater remains in the most efficient position.

New Strong Spotlight

A DC arc spotlight with a built-in power conversion unit is announced by the Strong Electric Corp. Known as the "Super Trouper," this high-intensity spotlight is an addition to the Strong line which includes the Trouper AC arc spot and the Trouperette incandescent spot. It is designed for use in arenas, stadiums, fairgrounds and large auditoriums and theatres.

With its combination transformer and selenium rectifier, the Super Trouper draws only 10 amperes from a 220-volt AC power source and converts it to DC of the proper voltage for use at the arc. This spotlight will surpass the brilliancy of any vertical arc unit, and produce about 2½ times as bright a light as is possible with the Trouper model, the announcement stated. For a 300-foot throw, the size of the projected spot is variable from a minimum of a 24-inch "head spot" to a 75-foot "flood."

The optical system uses a silvered glass reflector. The light is beamed through a circular aperture and projected to the stage by means of a lever-controlled, two-element lens with variable focal length.

Carbons are fed automatically by an electric motor which maintains a constant arc gap. A trim consists of a 6-mm x 9" copper-coated negative and a 7-mm x 12" copper coated high-intensity positive. The color boomerang contains six slides and an ultra violet filter holder. Color slides are quickly inserted and released. The horizontal masking control can be angled at 45 degrees in each direction. A dimmer controls spot intensity.



Strong's "Super Trouper" spotlight

61% of Films Use Color

A rundown of nearly completed distributors' schedules for 1955 shows 246 features released or due for release before Dec. 1, of which 61% or 152 are color films with 94 in black-and-white. Taking the six major studios only, color production comprises 71% of the total. The high percentage is due to the fact that these studios produce mainly CinemaScope pictures that do not come in monochrome.

However, it is predicted that black-and-white will be on the increase during the coming year because of the high cost of color and the success of such black-and-white films as "On the Waterfront."

COLOR FILM REPRODUCTION

(Continued from page 16)

represent equal differences in composition.

Our trichromatic specifications are very different from the I.C.I. "trichromatic coefficients" formerly widely used in colorimetry. A trichromatic specification designates the relative intensities of the blueviolet, green, and red primary components of a color reduced to the relative stimulation of the three primary "receptors" in the eyes of an "ideal" observer.

As we prefer to write them, the order of primaries is alphabetical (B-G-R). Numerically, these designations range from 0 to 100 per cent for each primary in the case of all non-fluorescent color phenomena. The two extremes, therefore, are 100-100-100 for hueless white at a specified color temperature and 0-0-0 for black, the complete absence of light. Red is designated by 0-0-100, medium gray by 25-25-25, ultramarine-blue by 100-15-0, cinnamon-brown by 5-15-25, rose-pink by 80-55-100, iceberg-blue by 100-100-40, etc.

Brightness Affects Color

The completed chromaticity triangle with the hue divisions correctly marked represents the "ideal" gamut of human color vision. In actual color viewing, however, the response-gamut of the human eye only approximates this complete gamut of pure, absolutely saturated, hues. The ideal gamut is closely approached by the eye only when the pure hues are observed at rather low levels of illumination (not exceeding 2 footlamberts). At high light levels the *same* pure hues apparently lose saturation, and most of them even seem to shift in hue.

Of the three primaries, green is the worst troublemaker for the color engineer on account of the spurious blueviolet and red stimulation generated in the eye by intense brightness levels. As brightness is increased, even the purest primary green (530 millimicrons) seems to become yellower and paler. This phenomenon, demonstrated graphically by Fig. 4, unfortunately renders impossible the perfect reproduction of saturated blue-greens and blues by mixing primary blueviolet and green lights at moderate and high brightness levels — a limitation of all trichromatic color-reproducing processes. If a bluer green is chosen for the green primary, reproduction of the blues is improved, but reproduction of the reds, oranges, and yellows deteriorates.

This defect of tricolor photographic reproduction, it must be pointed out, is not due to any flaw in the trichromatic theory of human color vision, but to the fact that moderate and high brightness levels broaden the sensitivity of the color receptors of the eye to include desaturating spectral regions. When the red receptor is affected by the green region of the spectrum, even the very purest green light excites sufficient red stimulation to impart a yellowish cast to the green — and mixtures of yellow-green and blueviolet cannot possibly duplicate the spectral blues which, even at the highest brightness levels, stimulate the red receptor less than does the green region of the spectrum.

Blueviolet is the primary that seems to change most in hue whenever its brightness is changed. At very low light levels this primary is definitely purplish, the result of normal, though inexplicable, red stimulation in the extreme violet of the visible spectrum. As the brightness is raised, however, blueviolet becomes bluer and less violet. At excessively high light levels, blueviolet looks like an extremely bright blue — a chameleon color indeed!

Red — pure primary red of about 700 millimicrons — is relatively immune to apparent changes in hue and color saturation with changes in brightness. Whether bright or dim, primary red *looks* red; it begins to pale and turn scarlet (orange-red, implying slight green stimulation) only at light levels sufficiently high to make yellow, green, and blue look almost white.

The "perception gamut" of ordinary color viewing, therefore, does not and cannot correspond *exactly* to the perfectly saturated full gamut of the *ideal* chromaticity triangle. But no matter: we may assume, for the sake of simplicity and accuracy in colorimetric

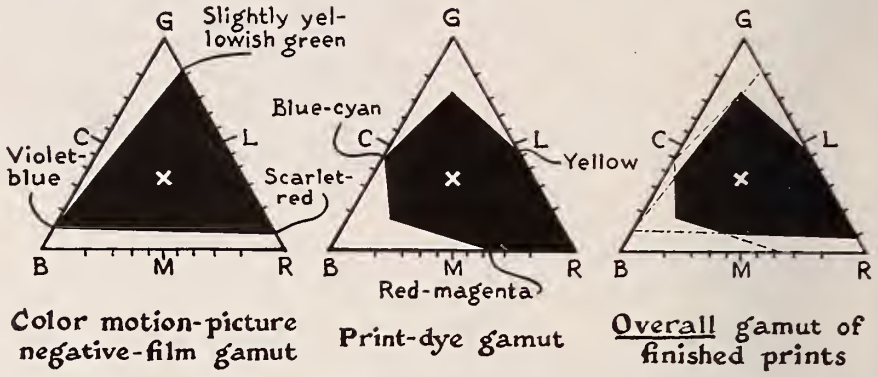


FIG. 5. Calar "gamuts" determined an the chramaticity triangle far three steps in a certain papular subtractive color film pracess. The complete gamut of saturated hues is plotted on the sides of the triangle ta farm a cantinuaus circuit. Most phatagraphic and lithagrophic colar pracesses repraduce anly a partion af the full gamut ar range of colar at best, as indicoted by the blacked-in areas. Far a complete explanation, read article.

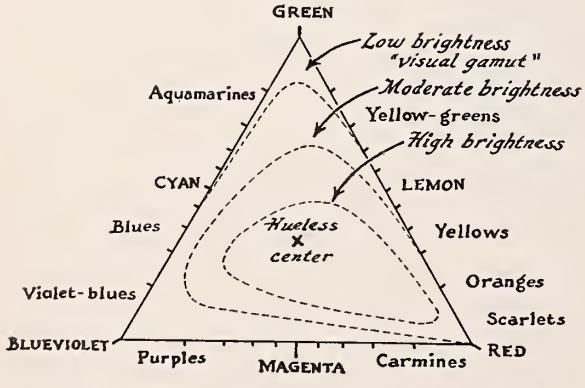


FIG. 4. The perceptible hue gamut ar range af human calar visian appraaches the "ideal" gamut (as represented by the sides af the chramaticity triangle only at very low levels af illumination. At higher brightness levels the chramaticity triangle apparently "degenerates" inta curves very similar ta those shawn. Note that the degenerate triangle has na definite point where primary green may be located: a paint placed an the peak will either stimulate the red receptar af the eye tao much, ar the bluevialet receptor, or both. Even pure primary green becames yellawer and paler when observed at high levels of brightness.

calculations, that the gamut of the ideal triangle represents the visual gamut of the ideal human observer.

Perfection Not Possible

The gamut of a color-picture process, we must admit, can never attain the full range of the ideal chromaticity triangle — the color-perception range of our imaginary ideal human observer — even though the best additive projection processes come so close to it that saturation losses are quite negligible. As a matter of fact, the additively reproduced color of color Tv is a remarkably close approximation of the ideal gamut.

The reproduction of color by subtractive color printing (e.g. theatre-release motion-picture films) unfortunately departs rather widely from the full range of the chromaticity triangle in several regions of the hue gamut.

Figure 5 shows three chromaticity triangles on which the gamuts involved in a certain popular subtractive color-film process are plotted. That these gamuts fail to attain the maximum chromaticity range is revealed by the fact that none of them (the blacked-in areas) completely fills the ideal triangle.

In (A) of Fig. 5 is shown the gamut of the color negative used in the process under examination. While not perfect, this gamut is a very good one, and only fails "by a hair" to record in full saturation two relatively unimportant regions of the complete gamut — the blue-green region and the violet, purple, magenta, and carmine region. The blues also lose some saturation in photography, but the departure is almost too small to be noticed.

The color losses of this particular system of photography are occasioned by the fact that the "sensitivity peaks" of the color negative do not correspond exactly to the visual primaries as careful experiment has specified them (blueviolet, dominant hue 435 millimicrons; green, d.h. 530 millimicrons; red, d.h. 700). The blueviolet peak is too blue; and since blue consists of blueviolet light plus a small amount of green light, the blueviolet record is contaminated by a trace of green excitation. The green peak is actually a yellowish green, resulting in red contamination of the green record. The

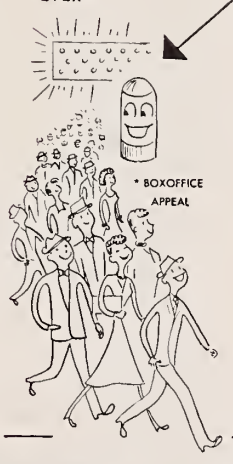
(Continued on page 28)



more B.A.*

*(BOXOFFICE APPEAL)

MOVIES ARE BETTER THAN EVER



with SUPER-SNAPLITE f/1.7 projection lenses

● GREATER LIGHT ● GREATER CONTRAST ● GREATER SHARPNESS

Watch your "B.A." climb when you install Super Snaplite Lenses. Give your patrons the benefit of pictures at their best. You can't beat the Super Snaplite f/1.7 when it comes to putting a clear, sharp picture on your screen.

Ask your Theatre Supply Dealer about these fine lenses. For more information ask your dealer or write for Bulletin 222.

"You Get More Light with Super Snaplite"

KOLLMORGEN Optical CORPORATION

Plant: 347 King Street
Northampton, Massachusetts

NEW YORK OFFICE: 30 CHURCH STREET, NEW YORK 7, N. Y.

New 8-mm Copper-Coated Carbon Designed For 60-70 Ampere Arclamp Operation

Recently made available, this new 8-mm, non-rotating positive carbon is designed to provide increases in light output efficiency and steadiness of operation.

By F. P. HOLLOWAY and R. B. DULL

National Carbon Company

A Division of Union Carbide and Carbon

AN ARTICLE titled "Projector Carbons for New Motion Picture Systems" which appeared in the July, 1953 issue of IP described in detail carbons developed in recent years for motion picture projection to meet the demands for more light arising from such innovations as the outdoor theatre, three-dimensional motion pictures, wide screen pictures and some forms of theatre television.

For the most part these carbons were of the rotating positive type for both reflector and condenser type projection lamps. The exceptions were a 9-mm Suprex carbon and an improved 7-mm Suprex carbon for reflector type lamps using copper coated non-rotating carbons. Described here is an improved 8-mm Suprex carbon, which is capable of producing more light and a steadier light at a higher efficiency than the old 8-mm Suprex carbon.

Performance of New Carbon

The new 8-mm Suprex carbon is designed primarily for use at 70 amperes. At this current and at 80% side-to-center light distribution, it produces approximately 7% more light than the old carbon, at a 10% slower burning rate. With the optical system of the projection lamp set for maximum screen light (60% side-to-center distribution) the new carbon produces 15% more light than the old carbon.

The new 8-mm Suprex carbon is noticeably steadier than the old, and light levels on the screen are more reproducible. At 70 amperes and 80% side-to-center light distribution the probable difference in screen light from carbon to carbon is 60% less for the new 8-mm Suprex carbon.

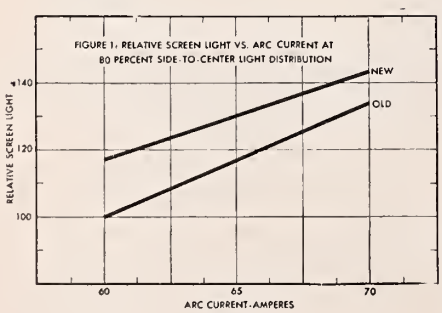


FIGURE 1

TABLE A

Voltage Power Source	Current With Old 8-mm Suprex Carbon	Changes in Current and Arc Voltage With New 8-mm Suprex Carbons	
		Amps.	Volts
55 V	60 Amps.	-5	+2
	65 "	-4	+1
	70 "	-3	<1
110 V	60 "	-2	+2
	65 "	-1	+1
	70 "	-1	+1

The large increase in reproducibility is due in part to improved processing techniques and in part to the fact that the improved positive has a much higher overload current than the old carbon which, at 70 amperes, was operating only slightly below its overload point.

Although the improved 8-mm Suprex carbon is designed primarily for operation at 70 amperes, it can be used at any current in the 60-70 ampere range. At 60 amperes it has the same burning rate and produces approximately 20% more light than the old carbon, regardless of whether the optics of the projection lamp are set for 80% side-to-center light distribution or for maximum screen light. The improvement in steadiness and reproducibility extends over the entire 60-70 ampere current range.

Fig. 1 shows the relative performance of the old and new 8-mm Suprex carbons in terms of relative screen light vs. arc current, at 80% side-to-center light distribution. Fig. 2 shows a similar relative performance of the two carbons at maximum screen light.

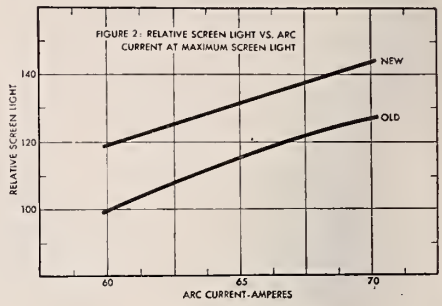


FIGURE 2

Increased Efficiency

As a result of both increased light and slower burning rates, the light per unit burning rate efficiency of the improved 8-mm Suprex carbon is as much as 20% higher than that of the old carbon.

Whenever the new 8-mm Suprex carbon is used, without altering the ballast setting, in a lamp which has been burning the old carbon, the arc voltage has a tendency to rise slightly and current to decrease. The magnitude of the decrease in current depends upon the voltage at the power source. Table 1 shows the magnitude of the increase in arc voltage and decrease in current for 55 and 110 volt power sources when the power sources are set to deliver 60, 65, and 70 amperes with the old carbon. A plus sign indicates an increase and a minus sign a decrease in current or arc voltage. It can be readily seen that the decrease in current is greatest for low voltage power sources.

It is recommended that when changing from the old to the new 8-mm Suprex carbon the current be increased to its maximum recommended value by resetting the ballast, to take full advantage of the increase in light.

More Football Telecasts

The first season of telecasting Notre Dame football games to hotels *via* closed circuit proved so successful that plans are underway to increase the number of telecasts and participating hotels next year, according to the network.

IA ELECTIONS

LOCAL 150, LOS ANGELES, CALIF.

Wallace G. Crowley, *pres.*; J. H. "Red" McDonald, *vice-pres.*; Charles Y. Crowe, *sec.-treas.*; Clyde W. Shuey, *bus. rep.*; E. R. "Sam" Pierson, *guide*; C. C. Bolinger, Virgil Crowell, John Sickinger, *exam. board*; Harold Angel, H. Clay Blanchett, Harold Chew, Clem Marchand, Leo F. Stockwell, *exec. board*; A. R. Adams, H. Chew, W. G. Crowley, Paul Mahoney, Magnus Nielsen, and C. W. Shuey, *del. to IA Convention.*

LOCAL 173, TORONTO, ONT., CANADA

Jim Sturgess, *pres.*; Roy O'Connor, *vice-pres.*; Lou Lodge, *sec.-treas.*; Bert Higgins, *rec.-sec.*; A. L. Pat Travers, *bus. rep.*; Loren Clark, Dave Siegel, Roy Wilson, Graydon Hulse, *exec. board*; George Rands, Hilliard Gray, Jack Harris, *trustees*; Russ Sturgess, *sgt.-at-arms*; George Robinson, *tyler*; J. Sturgess, Pat Travers, Art Milligan, L. Lodge, *del. to IA Convention.*

LOCAL 181, BALTIMORE, MD.

Louis Sieber, *pres.*; Charles Grauling, *1st vice-pres.*; Charles Dotson, *2nd vice-pres.*; Hal Brasswell, *3rd vice-pres.*; Tom P. Finn, Sr., *fin.-sec.*; Calvert Silverblatt, *rec.-sec.*; Maurice Rushworth, *bus. rep.*; Ralph Rushworth, Harry Gentile, Jack Hawkins, *trustees*; Thurman Durst, George Dusman, *scale comm.*; Elmer Kastner, *sgt.-at-arms*; L. Sieber, C. Grauling, and Sam Isaacson, *del. Baltimore Fed. Labor.*

LOCAL 257, OTTAWA, ONT., CANADA

J. McGuire, *pres.*; J. Macauley, *vice-pres.*; W. M. Hall, *sec.-treas.*; W. H. Hartnett. *bus. rep.*; S. Ventura, *sgt.-at-arms*; E. B. Field, D. M. Ritchie, J. Shearer, *trustees.*

LOCAL 332, CLINTON, IOWA

H. C. Andrews, *pres.*; Charles Tintey, *vice-pres.*; A. E. Hubbard, *sec.-treas.*; Paul Nadelhoffer, *bus. rep.*; Kenneth Haas, *sgt.-at-arms.*

LOCAL 348, VANCOUVER, B. C., CANADA

A. E. McManus, *pres.*; Hank Leslie, *vice-pres.*; George Thrift, *sec.*; Frank Smith, Sr., *treas.*; Don Foli, *rec.-sec.*; Les Walker, *bus. rep.*; Abe McCartnie, Frank Smith, and L. Walker, *del. IA Convention.*

LOCAL 401, CENTRALIA-CHEHALIS, WASH.

Ross V. Kinsey, *pres.*; Harry A. Kirkpatrick, *vice-pres.*; Charles W. Wheeler, *sec.-treas.*; Lowell L. Wheeler, *rec.-sec. District bus. rep.*: C. E. Stapels, *Centralia-Chehalis*; H. A. Kirkpatrick, *Longview-Kelso*; H. D. Stark, *Vancouver-Camas.* C. L. Leach, *sgt.-at-arms*; H. A. Kirkpatrick, North D. Stark, Wayne A. Kirkpatrick, R. V. Kinsey, C. W. Wheeler, *exec. board*; J. S. Cunlisk, J. R. Spiker, C. E. Stapels, *trustees.*

LOCAL 735, MT. CLEMENS, MICH.

Fred Devantier, *pres.*; Dan Defenbaugh, *vice-pres.*; Earl Natzel, *cor.-sec.*; Norman Pingel, *fin.-sec.*; Roy Suckling, *bus. rep.*; Clarence Bushart, *sgt.-at-arms*; E. Natzel, *del. at large*, and F. Devantier, *alternate.*

For repeat-patronage

MAGNETISM

on your screen . . .



CinemaScope production, "The Rains of Ranchipur," filmed with B&L CinemaScope Camera Lenses.



Bausch & Lomb Super Cinephor Projection Lenses



Bausch & Lomb CinemaScope Projection Lenses

. . . depend on the

PERFECT-PICTURE PAIR!

The better they *see*, the more they'll enjoy the movies you show . . . and the oftener they'll come back. Insist on the B&L Perfect-Picture Pair for today's clearest, brightest full-screen views. Complete line for all projectors . . . from neighborhood theatre to largest drive-in . . . for Wide Screen, CinemaScope, SuperScope.

SEE THE BIG DIFFERENCE . . . FREE DEMONSTRATION! Write for demonstration, and for Catalogs E-118, E-123 and E-141. Bausch & Lomb Optical Co., 61601 St. Paul St., Rochester 2, N. Y. (In Canada, General Theatre Supply, Toronto.)

Academy of Motion Picture Arts and Sciences
Honorary Award for Optical Service to the Industry

BAUSCH & LOMB

SINCE B&L 1853

COLOR FILM REPRODUCTION

(Continued from page 25)

red peak is a scarlet, not pure primary red, hence green contamination of the red record.

The color-negative gamut plotted in (A) accordingly corresponds to the ideal, fully saturated gamut only from yellowish green down through chartreuse, lemon, yellow, orange, to scarlet, and also at one point in the violet-blue region (ultramarine).

Color Print Limitations

In (B) of Fig. 5 we see the gamut of the reciprocal-dye combination used for making the prints in color. This gamut is obviously very far from perfect, although it is admittedly one of the best obtainable with commercial process dyes having good working properties.

The lemon dye is not true lemon (bright, slightly greenish yellow), the complementary of blueviolet, but a warmer yellow. The cyan dye is definitely bluer than cyan (bright greenish blue), the complementary of red. Because of the chromatic departures of these two dyes from the true reciprocal hues, the gamut boundaries cannot follow the sides of the ideal triangle, but must meet at a point which represents a desaturated, or slightly dark, green. The magenta dye is very much redder than true magenta (dazzling purplish rose), the complementary of green, hence the "blue-cyan" to "red-magenta" lines cannot meet at saturated blueviolet, but must intersect a point representing a deep lavender, or desaturated blueviolet.

The printing-dye gamut, therefore, is capable of reproducing with perfect fidelity only those hues from yellow down through orange, scarlet, red, crimson, and carmine, and a single point in the blue-cyan region (turquoise).

Matters are complicated by the curious fact that the "dominant hues" of the printing dyes shift somewhat with changing densities — the so-called Beer effect. These dyes approach the true reciprocals in hue more closely than is shown in Fig. 5B when lightly printed, as in areas of low photographic density in the color pictures. They depart from the desired norm even more seriously than indicated in the diagram when heavily printed, as in areas of high pictorial density. The lemon dye becomes more deeply yellow, even acquiring an orange cast, in high concentration; the magenta dye becomes even redder — quite crimson — when highly concentrated, and the cyan dye an even deeper, or less greenish, blue.

Selection of Dyes

Reciprocal-color printing dyes are selected mainly on the basis of light-transmission efficiency, primary-color absorption, and chromatic saturation. Departures in dominant hue from the true reciprocals are tolerated as a necessary evil.

While it is possible, for example, to manufacture a dye having true cyan as its dominant hue, such a dye, in order to transmit blueviolet and green light efficiently, would necessarily transmit the red present in the yellow-green and greenish yellow regions of the spectrum. But because a satisfactory cyan print dye must absorb all red to give saturated (red-free) blues when combined subtractively with various proportions of magenta, a desaturated, or red-transmitting, cyan would necessarily result in the production of muddy, desaturated greens and blues.

Compromise Required

Narrow-band transmission of the blueviolet and green primaries by a spectrally pure cyan dye, on the other hand, would result in desaturation by darkening the colors abnormally. For these reasons a blue-cyan (turquoise) dye which transmits the blueviolet very well and the more red-free portions of the green region of the spectrum, but which absorbs the green-yellow, yellow, orange, and red regions, is used in subtractive color

SUPER HILUX
•
HILUX f/1.8
•
SUPER-LITE

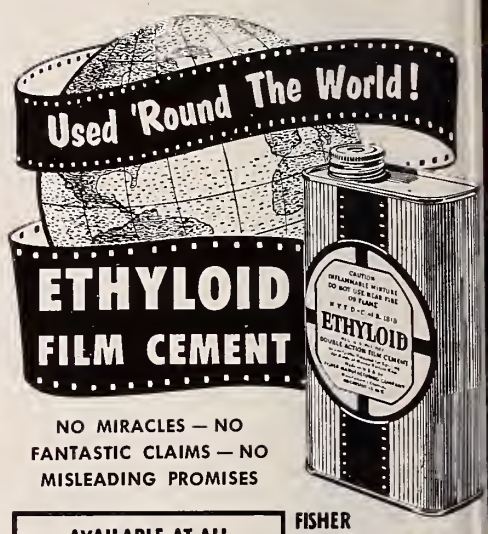
3

of the best prime lenses offered for today's wide screen projection.

•

See your Theatre Supply Dealer or write us directly . . . NOW

PROJECTION OPTICS CO.
ROCHESTER, NEW YORK



NO MIRACLES — NO FANTASTIC CLAIMS — NO MISLEADING PROMISES

AVAILABLE AT ALL THEATRE SUPPLY DEALERS

FISHER MANUFACTURING CO.
1185 Mt. Read Blvd
Rochester 6, N. Y.

for VistaVision, CinemaScope

Lorraine ORLUX SUPER-CHARGED LARGE-CORED Carbons

For DRIVE-INS & THEATRES with HUGE, WIDE-AREA SCREENS • CARBONS, Inc. BOONTON, N.J.

and all other Wide-Screen Presentations

printing for best overall results.

The other two reciprocal-hue dyes — the magenta and the lemon — present similar problems, hence the use of a red-magenta (carmine) and a yellow-lemon (bright yellow) for the most satisfactory color reproduction. Of the three dyes, the magenta dye has the poorest transmission characteristics and departs most from the norm; the lemon dye has the best properties, and gives the least trouble.

In (C) of Fig. 5 the gamuts in (A) and (B) have been combined. This is the resultant gamut of the projection print. Observe that only the hues from yellow down through the rich yellows (ochre and saffron) and orange to scarlet can be reproduced in full saturation. Even though all other hues are desaturated by the overall color process, the most serious chromatic deficiencies (sufficiently serious to be detected by the average movie patron) reside in the yellow-green, green, blue-green, violet-blue, and purple regions of the gamut.

Because of the prevalence of foliage in many exterior scenes, the loss of saturation in the yellow-greens and greens is especially serious. Grass and leaves, no matter how intensely green in the original, will come out as dull olive-greens on the film and, of course, on the screen. A too-yellow green response of the negative and a too-desaturated cyan in printing the color films are fatal to the correct rendition of foliage.

Because human vision is most sensitive to the green region of the spectrum, image definition in color photography is determined largely by the green record, represented by magenta dye in the color prints. It is important, therefore, to preserve maximum definition in the green record in all duplicating steps. The most serious disadvantage of the imbibition, or dye-transfer, process is the tendency of the magenta dye to "bleed," or spread in the gelatin coating of the print stock.

[TO BE CONCLUDED]

Info about Free 16-mm Films

Association Films, distributor of free-loan films, is making available a series of booklets describing 16-mm films for community showings.

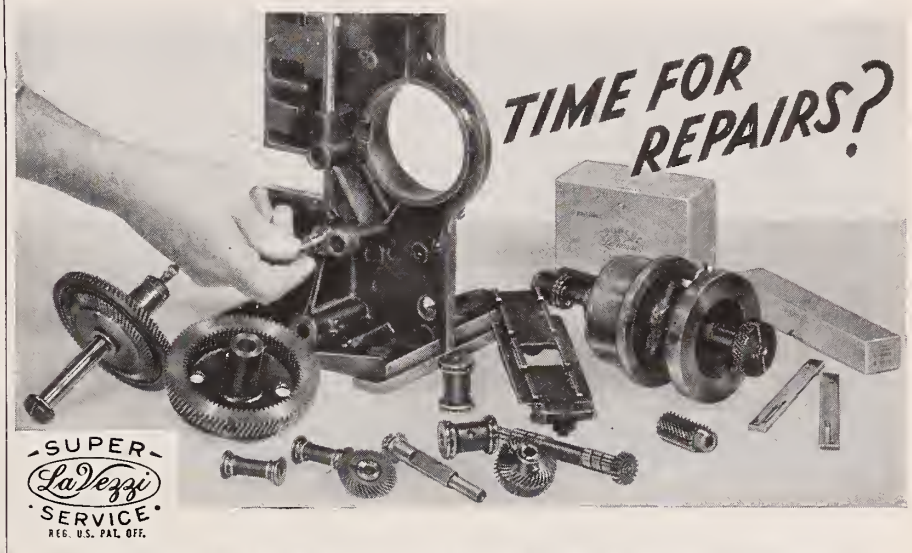
Booklets can be obtained free by men's clubs, women's clubs, churches, industry and business, farm groups, grade schools, and high schools. A special booklet, "What's New in Free Films," as well as the other booklets, may be obtained by writing to Association Films, 347 Madison Ave., New York 17, N. Y.

In Canada, 49 specially selected "kits" of films for trade union use are currently being made available. The film programs are offered through the Canadian Dept. of Labor in cooperation with the Canadian Trade Union Film Committee.

Famous Film Library Rotting

Funds are being raised by the Museum of Modern Art in New York in an attempt to save its vast film collection by transferring old nitrate prints to acetate stock. Ways and means are being studied for permanently preserving the Museum Library's collection, which is estimated to contain more than 10,000,000 feet of important film..

The process of disintegration among the old nitrate prints is becoming more and more acute as time passes, increasing the possibility of irreparable damage to the films. The aim of the current campaign is to raise $20,000 to supplement a $25,000 grant made available by the Rockefeller Foundation.



Any wide screen system puts projection equipment to its severest test. Slight picture jump which may pass on a small screen cannot be tolerated on large screens. Your dealer is prepared to show you how your present equipment can be rebuilt to give unexcelled performance and long trouble-free service with genuine *LaVezzi* Projector Parts.

LAVEZZI MACHINE WORKS
4635 WEST LAKE ST. CHICAGO 44, ILL.



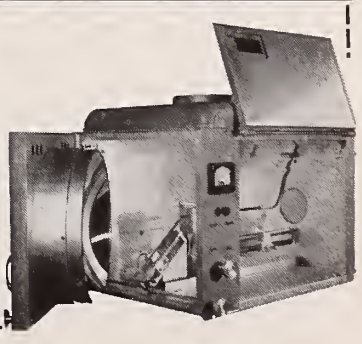
CONEMATIC 70 to 140 AMPS

PROJECTIONISTS' *Arc of Century*

EXHIBITORS' *Ideal for Economy*

Dealers Have Data, or Write to:

"DOC" FAIGE & ASSOC'S., 113 W. 42 ST., N.Y.C. — —



OBITUARIES

FELIX W. KAMP, 66, member of Philadelphia Local 307, succumbed to a fatal heart attack suffered December 12 at Town Hall there where he had been employed for the past ten years.

• • •

A. P. HANSEN, member of Milwaukee Local 164 since 1919, died last month. At the time of his death he worked as projectionist at Fox's Strand Theatre in Milwaukee.

• • •

CECIL R. WOOD, Sr., 82, veteran member of New York Local 306, died recently in his sleep at his winter home in Jacksonville, Fla. He was one of the pioneer projectionists in this country and traveled all over the United States back in the early 1900's showing motion pictures. In 1914 he was selected by D. W. Griffith to show *"The Birth of a Nation"* to President Woodrow Wilson and his cabinet in a special preview at the White House. Wood later toured the country for four years with this classic. Prior to his retirement in 1952, he worked as projectionist at the Paris Theatre in New York City. Survivors are his daughter and two grandsons.

• • •

SAM LEAVITT, 53, member of Local 160, Cleveland, Ohio, died last month. He was projectionist at the Circle Theatre there for several years until failing health forced him to retire. His wife, brother, and four sisters survive him.

Price of Manco-Vision Screen

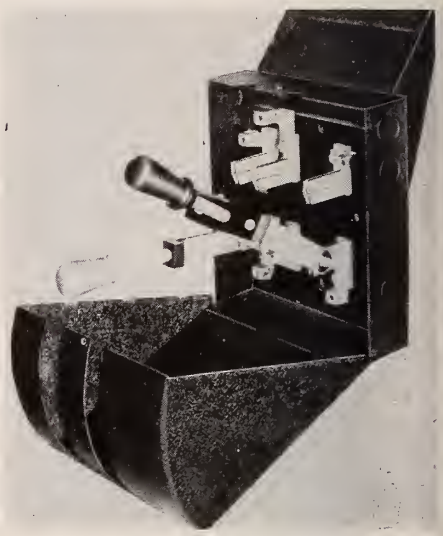
We are informed by J. B. Schuyler of the Manco-Vision Drive-In Theatre Screen company that the extruded aluminum screen developed by the Motion Picture Research Council is priced at $2.00 per square foot. The price of $1.85 per square foot, quoted in a recent issue of IP, was originally considered; however, freight, packaging and inspection charges forced the price higher.

Reserved Seat Policy

As an example of the growing trend toward "roadshow" policies in big city theatres, New York's Roxy recently announced a new sales plan for reserved seats. One thousand reserved seats in the mezzanine are now made available for all performances to patrons desiring advance assurance of seating on selected dates. Tickets may be purchased through the mail or at the boxoffice.

200-Ampere Arc Switch

A 200 Ampere, 2-step arc lamp switch is available from National Theatre Supply. The switch is designed to handle the heavier current flow utilized by the newer arclamps and can be mounted directly on any enclosed Simplex pedestal, indoor or drive-in type.



New switch from NTS

The reduced amperage feature for striking the arc is accomplished by first closing the double-bladed portion of the switch — controlled by the black handle. As soon as the arc has been struck, full arc amperage is obtained by closing the single blade which is the red handle on the switch.

This is felt to be a distinct advantage over other types of reduced amperage switches where it is necessary first to move the handle to a half-way position for striking, and then to close the switch entirely for full amperage. To "break" the switch all blades are activated by the black handle only.

The switch mounts rigidly to the rear surface of the pedestal. In this position, rough handling during the "make" operation will not affect the line up of the arc lamp.

SPLICES NOT HOLDING ?

Film breaks are costly. Play safe by using

JEFRONA

All-purpose CEMENT

Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.

CAMERA EQUIPMENT CO.
DEPT. J-1-8
1600 Broadway New York 19, N. Y.

Vallen for CURTAIN CONTROLS, TRACKS and SPECIAL OPERATING DEVICES
VALLEN, Inc.
AKRON 4, OHIO

Clayton Ball-Bearing Even Tension Take-Ups

For all Projectors and Sound Equipments

ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS.
SILENT CHAIN DRIVE

THE CLAYTON REWINDER

FOR PERFECT REWINDING ON 2000-FOOT REELS.

CLAYTON PRODUCTS CO.
31-45 Tibbett Avenue New York 63, N. Y.

N.T.S

Your Guarantee of Consistent Quality and Outstanding Service For Every Theatre Need!

NATIONAL THEATRE SUPPLY
29 Branches Coast to Coast

DESIGNING LENSES

(Continued from page 8)

the aberrations of this lens were found to be very small, and the patches of light formed by the lens, represented by the diagrams in row T, were small, bright points much less than 1/1000 inch across. These diagrams indicate that the lens as thus improved will make an unusually sharp, crisp image.

This new method of analyzing the image is already being applied to increasing the aperture or "speed" of lenses used for several purposes. Such an increase in aperture is helpful in reducing the amount of light needed on movie sets, increasing the brightness of theater screens, and shortening the exposure required in aerial photography. The new method should be especially useful in designing lenses for microcopying, where a whole book may be copied on an ordinary index card and the very sharpest image is required.

ARCLAMP, PROJECTOR OPTICS

(Continued from page 13)

when present, are minimized in specular (motion-picture and lantern-slide) projection because of the absence of grossly divergent rays coming from the object (transparent photograph).

A Simple Test

The "diffuse" condition assumed by the author of the letter may be closely approximated in a standard movie projector for demonstration purposes by interposing several layers of frosted glass behind the aperture and as close as possible to the film. When this is done, both screen illumination and the contrast factor of the projected picture are seriously reduced. The distribution of illumination is also altered. If the lens is not of the best quality, coma and spherical aberration will attain maximum values, imparting to the picture a soft-focus appearance.

It may also be mentioned that the alignment of the lamp optical system is not at all critical in diffuse projection. If this type of projection were used in the theatre (that is, if the film base were made of rice paper instead of clear plastic), the lamphouse could be moved very far off the axis of the projector without noticeably affecting either the brightness or the distribution of the illumination when film is being shown.

It is a fact that the passage of light rays from the lamp mirror (or condenser) to the projection lens is the same whether film is in the machine or not. The entire setup — lamp and projector mechanism with its lens — must be regarded optically as a single unit, hence the necessity of extremely accurate alignment of the lamp for satisfactory projection. Every possible effort has been made by lamp manufacturers to insure correct alignment of mirror and carbons: the projectionist must exert every effort to maintain accurate alignment of the lamp and the mechanism.

The matter of matching the speed of the lens to that of the lamp optical system is important as regards the intensity and the uniformity of screen light; and far from being "so much propaganda," it represents both in theory and in fact the hard and unalterable realities of projection optics.

Your doorman may be a dream...



Your usherettes may be starlets...



BUT EVERY PERFORMANCE STILL MUST BE PERFECT!

For a perfect performance, vital operating equipment has to work without a single slip. The best man to keep it exactly that way is an expert RCA Theatre Service Engineer. He's the *only* man who brings to your house the full backing of RCA's technical resources.

RCA SERVICE COMPANY, INC.

A Radio Corporation of America Subsidiary — Camden, N.J.

Splicing Problems Are Coming!

If you're thinking of ordering a new splicer, be smart and investigate the Ace Clear Vision Splicer, a completely new method.

- It makes a strong splice on acetate.
- Will splice the new DuPont Cronar base and join Cronar to acetate.
- It is non-magnetic — Will not injure CinemaScope soundtracks.



Ace Electric Mfg. Co., 1458 Shakespeare Ave., New York 52, N. Y.

YOUR BEST BUY

U. S. SAVINGS BONDS

INTERNATIONAL PROJECTIONIST

Index—January to December, 1955

INDEX BY CLASSIFICATION

ARCLAMPS, CARBONS, LIGHT

Ashcraft's New Cinex 170 Arclamp, *Clarence Ashcraft,* March, p. 23.
Efficiency of Crater Brightness With Water-Cooled Arc-Spot Temperatures, *Charles A. Hahn,* Aug., p. 14.
Improved Optics, Light Output for Strong "135" Lamp, Feb., p. 22.
The Improved Strong '135' Projection Arclamp, *Arthur J. Hatch,* April, p. 16.
Light Sources for Film Projection, *Robert A. Mitchell,*
Jan., p. 7; Feb., p. 14; March p. 14; April, p. 10.
New Yellow-Flame Carbons Increase Depth, Sharpness in Photographic Image, *Charles Handley,* Aug., p. 20.
The Ole Cranktwister on the Subject of Arclamp Lubrication, *Frank W. MacDonald,* Dec., p. 27.
Strong's "Lightronic" Arc-Gap Control, April, p. 17.
Tips on Filament Projection Lamps, April, p. 20.
What Do You Know About Carbons? May, p. 25; June, p. 33; Aug., p. 27; Nov., p. 28; Dec., p. 36.
What Is (K°) Color Temperature? June, p. 10.

BOOK REVIEW

Closed Circuit Data Book, *Leonard Spinrad,* Dec., p. 35.
Kinoteknik, *Max Scharnberg,* April, p. 21.
Theory of Lenses, *E. W. H. Selwyn,* Sept., p. 29.

CINEMASCOPE

(See Lenses, Projectors, Sound and Wide Screen)

CINERAMA

Lester Isaac: Cinerama Caps Notable Career, June, p. 16.
New Cinerama Feature Opens in New York, Feb., p. 21.

COLOR FILM

Color and Its Reproduction on Film, *Robert A. Mitchell,* Dec. p. 7.

DRIVE-IN THEATRES

Aluminum Plate Screen for Drive-Ins, Nov. p. 26.
Bigger Drive-in Pictures Require Big-Scale Thinking, May, p. 12.
SMPTE Survey of Drive-In Theatres, *Frederick J. Kolb, Jr.,* Oct., p. 13.
Wider Screens in Drive-Ins, *Ralph H. Heacock,* April, p. 14.

FILM — DAMAGE, SPLICING

All-Purpose Ace Splicer, Nov., p. 23.
Cronar, New DuPont Film Base Soon to be in Production, Nov., p. 16.
Film Damage on the Increase, *Henry B. Sellwood,* Jan., p. 14.
Low-Down on Silicone-Treated Cloth for Various Projection Room Uses, June, p. 22.
A Novel Film-Splicing Method, March, p. 7.
Old-Time Movies Restored by a Novel Process, Aug., p. 25.
Prevention of Damage to Prints, *Robert A. Mitchell,*
June, p. 7; July, p. 9; Aug., p. 15.
Projection Expert—Unknown and Unknowing; To Which IP Replies, *Robert A. Mitchell,* Aug., p. 17.
Splices in Negative Showing Through Positive to the Screen, Aug., p. 25.
That Old Refrain—Just Try to Focus, May, p. 26.

GENERAL

After the Technological Furore—What? *Chauncey Greene,* Jan., p. 21.
British Projectionist Opinion on the Line, March, p. 10.
A Few Words on Diverse Topics, April, p. 7.
An "Ideal Theatre" is Planned for Historic Williamsburg, Dec. p. 25.
Increased Attendance Seen, May, p. 15.
More Electronic Marvels on the March, Jan., p. 24.
1954: A Decisive Year for Film Industry, *James Morris,* Jan., p. 11.
1945 to 1955: Ten Years of Progress in Projection Technology, Dec., p. 21.
Notes on Exhibition in Foreign Lands, *Dr. John G. Frayne,* Jan., p. 13.
RCA Reproduces Pictures by Magnetic Tape System, Dec., p. 18.
SMPTE Papers Abstracts, Oct., p. 24.
"Solar Furnace" Resembles Projection Arclamp, Dec., p. 29.
TESMA Forum Will Take on All Technical Questions, Oct., p. 24.
TESMA Show to Spotlight New Equipment, Sept., p. 22.
Test Your Electrical I.Q., April, p. 20.
Water the Leaves—Neglect the Roots, March, p. 10.
Wendt House Party for Harry H. Strong, Feb., p. 16.

HISTORICAL

The Development of the Motion Picture Projector, *Thomas Armat.*
March, p. 20; April, p. 15.
From Toy to a Great Industry, (Conclusion), *Jack E. Gieck,* Jan., p. 15.
Graphic Representation of Motiograph Progress Through the Years, Feb. p. 10.
Projector Archivist: Motion Picture Historian, *Ray Brian,*
June, p. 26; July, p. 14; Aug., p. 24; Oct., p. 29; Nov., p. 27; Dec., p. 31.
A Research Triumph: The Story of Black-and-White Film, *C. E. Kenneth Mees,* June, p. 15; July, p. 15.

LENSES, OPTICS

CinemaScope, Wide Screen Lens Calculations, *Joseph F. Holt,* March, p. 22.
A Difference of Opinion on "Light-Collecting Speed", *John R. Miles, Mark Stevens,* Sept., p. 20.
"*F*:1 Light-Collecting Speed," *F* Numbers, and *T* Stops, *Dr. K. Pestrecov,* July, p. 5.
Kodak Scientist Speeds Design of Fine Lenses, Sept., p. 24.
Lens Chart for Various Image Ratios, May, p. 8.
"Matching" Apertures and Lenses, *Robert A. Mitchell,* May, p. 7.
Modified C'Scope Lens for a 645-Foot Throw, April, p. 12.
More Optics Data, July, p. 6.
Optical Terminology, *John Arnold,* June, p. 26.
Projection Expert—Unknown and Unknowing; To Which IP Replies, *Robert A. Mitchell,* Aug., p. 17.
Rear-Projection CinemaScope Aboard Ocean Liners, *Norman Wasserman,* Dec., p. 30.
Recent Developments in Anamorphotic Systems, *G. H. Cook,* Aug., p. 8; Sept., p. 15.
That Old Refrain—Just Try to Focus, May, p. 26.

MONTHLY CHATS

All Industry Branches Interdependent, Feb., p. 5.
Burning Up the Film, July, p. 3.
"Good Equipment Seal" for Theatres; SMPTE Courses Point the Way, Nov., p. 5.
Lively TESMA Forum Planned; A Look Into the Future; Drive-In Screen-Brightness Survey, Sept., p. 5.
Looking Backward Over the Past Year; Combined Magnetic-Optical Print, Dec., p. 5.
On the Heat Problem, April, p. 5.
Print Identification June, p. 5
Release Print Confusion Must End; Who Steered Us Wrong? Oct., p. 5.
Roadshows the Order of the Future, March, p. 5.
Screens Can Be Too Big, May, p. 5.
Technicians Win Recognition, Jan., p. 5.
Unjustified Criticism of Projectionists, Aug., p. 5.

POWER SUPPLY

Bulb Rectifier Anatomy, Operation, *Arthur J. Hatch* and *IP Staff.* May, p. 17.
Rectifiers for Projection Arcs, *Robert A. Mitchell,* Nov., p. 7.

PROJECTORS, PROJECTION

Century Projectors in Improved Version, Aug., p. 30.

Fast-Pulldown Intermittent Movements Solve Many Projection Problems, *Jose Ruiz*, Nov., p. 13.
Inclusive Test Film by British Acoustic Films, Aug., p. 26.
Motio's Water-Cooled Gate, Aperture, *Fred C. Matthews*, May, p. 23.
Projection Room Booby-Traps, *Joseph Holt*, Aug., p. 7.
A "Push-Pull" Projector? *J. G. Jackson*, July, p. 13.
Recent Trends in Shutter Design for Theatre and TV Projection, *Robert A. Mitchell*, Sept., p. 7; Oct., p. 17.
Shutter Blade Width & Image Flicker, April, p. 21.
A 60-Degree Geneva Intermittent Movement? *J. G. Jackson*, Feb., p. 7.
Wooden Base Shifter for CinemaScope, *Julius Ralph*, Dec., p. 23.

PROJECTION (16-mm)

Circarama: Spectacular 16-mm Presentation at Disneyland, Sept., p. 10.
Double-Gaited 16-mm Shutter by Eastman, Aug., p. 24.
Portable Arclamp Equipment for 16-mm Projection, *Robert S. Freeman*, Dec., p. 19.
Setting Up 16-mm CinemaScope Roadshow for Business Film, *Jerry Fairbanks*, Dec., p. 32.
The New Victor "1600" Portable Arclamp Projector, April, p. 22.

SCREENS, SCREEN BRIGHTNESS

Aluminum Plate Screen for Drive-Ins, Nov., p. 26.
"Cinemaplastic" White Screen Coating, *Leonard Satz*, July, p. 21.
SMPTE Survey of Drive-In Theatres, *Frederick J. Kolb, Jr.*, Oct., p. 13.
Wider Screens in Drive-Ins, *Ralph H. Heacock*, April, p. 14.

SOUND REPRODUCTION, RECORDING

After the Last Shot Is Made, the Technicians Take Over, *Allan Balter*, Sept., p. 16.
The Combined Magnetic-Optical Soundtrack: A Move to End Industry Confusion, *James Morris*, Dec., p. 15.
Do Our Ears Grow Old? *H. C. Montgomery*, July, p. 17.
The Future of Magnetic Sound—Further IP Opinion on Sound, Oct., p. 26.
Just What Is Sound? Sept., p. 26.
Frequency Range and "Quality" Reproduction, Jan., p. 17.
Magnetic Recording, Reproduction, *L. D. Grignon*, July, p. 16.
New PhotoStereo Sound System, *Dr. John G. Frayne*, June, p. 24.
The Ole Crank-Twister. Subject: Linearity, (Threading Penthouse Soundheads), April, p. 22.
Proposed Magnetic-Optical C'Scope Prints, Nov., p. 10.
RCA Providing "Mixer" for Magnetic Sound Sept., p. 24.
A Stereophonic Sound System That Utilizes Haas Effect, *Bruce P. Bogert*, Sept., p. 12.
Versatile New Simplex Sound Systems, Sept., p. 14.

TELEVISION

An Ever-Changing Process: TV Studio Film Projection, June, p. 28.
Growth of Closed-Circuit is Aided by Portable Projectors, *Norman Wasserman*, Nov., p. 22.
Motiograph-Trad Theatre-TV Projector, Dec., p. 29.
On the Right Flank, on the Left Flank—and Surrounded, Aug., p. 30.
Small, Mobile TV Unit Gives 9 x 12 Picture, April, p. 28.
So . . . You Project-Film Guys Have Worries? June, p. 22.
This Business of Toll-TV, July, p. 22.
Toll-TV Row Spiced by FCC 24 Questions, March, p. 24.
Video-Film Camera, *Al Simon*, May, p. 22.

TODD-AO

Opinions Pro and Con About Todd-AO, Nov., p. 24.
The Todd-AO Projector for Both 70- and 35-mm Film, Feb., p. 11.
The Todd-AO System: A Projector for Both 70- and 35-mm Film, *James Morris*, Oct., p. 7.

VISTAVISION

(See Lenses, projectors, Wide Screen)

WIDE SCREEN

(See also Cinerama, Lenses, Projectors and Todd-AO)
Aperture for RKO Superscope 2/1 Prints, June, p. 10.
55-mm CinemaScope Negative Will Improve Definition, *Arthur Gavin*, Nov., p. 12.
Film Producer Praises VistaVision; Hits Hollywood Handling of 3-D, Jan., p. 22.
Fox Plans to Make 16-mm CinemaScope Films, March, p. 30.
Framing Index for Wide-Screen Pictures, Nov., p. 26.
The Ole Crank-Twister Considers "Asback" Ratios, June, p. 23.
Paramount's VistaVision Framing Index, Feb., p. 25.
Presenting CinemaScope Trailers, *Joseph F. Holt*, May, p. 16.
Release Print Aspect Ratios and Equipment Requirements. *Motion Picture Research Council*, Oct., p. 22.
World-Wide Concern About Technological Standards, Feb., p. 13.

INDEX BY AUTHOR

ARMAT, THOMAS
The Development of the Motion Picture Projector. March, p. 20; April, p. 15

ARNOLD, JOHN
Optical Terminology. June, p. 26

ASHCRAFT, CLARENCE
Ashcraft's New Cinex "170" Arclamp. March, p. 23

BALTER, ALLAN
After the Last Shot is Made, the Technicians Take Over. Sept., p. 16

BOGERT, BRUCE P.
A Stereophonic Sound System That Utilizes Haas Effect. Sept., p. 12

BRIAN, RAY
Projector Archivist and Motion Picture Historian.
June, p. 26; July, p. 14; Aug., p. 24; Oct., p. 29; Nov., p. 27; Dec., p. 31

COOK, G. H.
Recent Developments in Anamorphotic Systems. Aug., p. 8; Sept., p. 15

FAIRBANKS, JERRY
Setting Up 16-mm CinemaScope Roadshow for Business Film. Dec., p. 32

FRAYNE, DR. JOHN G.
New PhotoStereo Sound System. June, p. 24
Notes on Exhibition in Foreign Lands. Jan., p. 13

FREEMAN, ROBERT S.
Portable Arclamp Equipment for 16-mm Projection. Dec., p. 19

GAVIN, ARTHUR
55-mm CinemaScope Negative Will Improve Definition. Nov., p. 12

GIECK, JACK E.
From Toy to a Great Industry. Jan., p. 15

GREENE, CHAUNCEY
After the Technological Furore—What? Jan., p. 21

GRIGNON, L. D.
Magnetic Recording, Reproduction. July, p. 16

HAHN, CHARLES A.
Efficiency of Crater Brightness With Water-Cooled Arc-Spot Temperatures. Aug., p. 14

HANDLEY, CHARLES
New Yellow-Flame Carbons Increase Depth, Sharpness in Photographic Image. Aug., p. 20

HATCH, ARTHUR J.
Bulb Rectifier Anatomy, Operation. May, p. 17
The Improved Strong "135" Projection Arclamp. April, p. 16

HEACOCK, RALPH H.
Wider Screens in Drive-Ins. April, p. 14

HOLT, JOSEPH F.
CinemaScope, Wide Screen Lens Calculations. Mar., p. 22
Presenting CinemaScope Trailers. May, p. 16
Projection Room Booby-Traps. Aug., p. 7

JACKSON, J. G.
A "Push-Pull" Projector? July, p. 13
A 60 Degree Geneva Intermittent Movement? Feb., p. 7

KOLB, FREDERICK J., JR.
SMPTE Survey of Drive-in Theatres. Oct., p. 13

MACDONALD, FRANK W.
The "Ole Crank Twister". April, p. 22; June, p. 23; Dec., p. 27

MATTHEWS, FRED C.
Motio's Water-Cooled Gate, Aperture. May, p. 23

MEES, C. E. KENNETH
A Research Triumph: The Story of Black-and-White Film. June, p. 15; July, p. 15

MILES, JOHN R.
A Difference of Opinion on "Light-Collecting Speed." Sept., p. 20

MITCHELL, ROBERT A.
Color and its Reproduction on Film. Dec., p. 7
Light Sources for Film Projection. Jan., p. 7; Feb., p. 14; March, p. 14; April, p. 10
"Matching" Apertures and Lenses. May, p. 7
Prevention of Damage to Prints. June, p. 7; July, p. 9; Aug., p. 15
Recent Trends in Shutter Design for Theatre and Tv Projection. Sept., p. 7; Oct., p. 17
Rectifiers for Projection Arcs. Nov., p. 7
IP Replies to Critics of Projectionists. Aug., p. 17

MONTGOMERY, H. C.
Do Our Ears Grow Old? July, p. 17

MORRIS, JAMES
The Combined Magnetic-Optical Print: A Compromise to End Confusion. Dec., p. 15
1954: A Decisive Year for Film Industry. Jan., p. 11
The Todd-AO System: A Projector for Both 70- and 35-mm Film. Oct., p. 7

MOTION PICTURE RESEARCH COUNCIL
Release Print Aspect Ratios and Equipment Requirements. Oct., p. 22

PESTRECOV, DR. K.
"*F*:1 Light-Collecting Speed," *F* Numbers, and *T* Stops. July, p. 5

RALPH, JULIUS
Wooden Base Shifter for CinemaScope. Dec., p. 23

RUIZ, JOSE
Fast-Pulldown Intermittent Movements Solve Many Projection Problems. Nov., p. 13

SATZ, LEONARD
"Cinemaplastic" White Screen Coating. July, p. 21

SELLWOOD, HENRY B.
Film Damage on the Increase. Jan., p. 14

SIMON, AL
Video-Film Camera. May, p. 22

STEVENS, MARK
A Difference of Opinion on "Light-Collecting Speed." Sept., p. 20

WASSERMAN, NORMAN
Growth of Closed-Circuit Tv is Aided by Portable Projectors. Nov., p. 22
Rear-Projection CinemaScope Aboard Ocean Liners. Dec., p. 30

NON-SYNC REPRODUCTION

(Continued from page 10)

suggest the use of a special double-pole-double-throw relay which will disconnect the channel four magnetic amplifier at the same time that it connects the optical power amplifiier to the surround speaker matching transformer.

If the record or tape playback equipment was equalized for good response when used through the behind-screen speakers while the title curtain was closed, it is likely that improvement in high-frequency response will be noted when the surround speakers are used.

While most listeners will react favorably to the increased "brilliance" resulting from the change, careful listening tests should be made to determine if record scratch or surface noise can be heard. If the records in use have seen better days, they should be replaced. If new records of known quality still produce unwanted noises, it will be necesary to install suitable filters at the signal source.

Trans-Oceanic Tv Proposed

At a recent symposium in Washington, Dr. Allen B. DuMont told an audience of engineers that live Tv between Europe and the U.S. is now "completely technically feasible." The means to achieve this would be a system of transmitters so located as to relay the signals. Through what he called "scatter transmission techniques," Dr. DuMont said that signals could be bounced off the stratosphere, vastly increasing the present range of radio and Tv broadcasts. He suggested that congress immediately consider establishing a trans-Atlantic hookup.

Norman Oakley Succumbs

Norman F. Oakley, 61, special advisor on motion picture sales for Du Pont in New York, died on November 4. Formerly general supervisor of experimental design, construction, and operation for Monmouth Chemical Co., Keyport, N.J., Mr. Oakley joined Du Pont in 1916 as supervisor of experimental film base production at Parlin, N. J. He was instrumental in the design and operation of Du Pont's first experimental and commercial film manufacturing plants and designed much of the equipment used in the process.

Mr. Oakley was a member of SMPTE, American Society of Cinematographers, Motion Picture Pioneers, and an honorary member of IA Cameramen's Local 644, N. Y. C.

16-mm Roadshowings of "Robe"

Plans have been drawn by 20th Century-Fox for roadshowing of "The Robe" in 16-mm CinemaScope.

How Many?

Was this copy dog-eared when it came to you? How many men read it ahead of you?

You would receive a clean, fresh copy if you had a personal subscription—and you wouldn't have to wait—you would be first to read it.

Use coupon below.

INTERNATIONAL PROJECTIONIST,
19 West 44th St., New York 36, N. Y.

Enter my subscription for ☐ 1 year—12 issues—$2.50
☐ 2 years—24 issues—$4.00

Foreign and Canada: Add 50c per year.

Name .....

Address .....

City ..... *Zone* ..... *State* .....

He brought snow to New Guinea



DECEMBER 24, 1944. The captured, rebuilt airstrips bake under a blazing sun. No breeze stirs the kunai grass. The dim, weather-stained notice clinging to the mail-room door tells you Jap subs sank the ship carrying Christmas packages.

If you punch two buttons on the walkie-talkie at the same time, you can tune in the Jungle Network. The song you hear is a favorite all over the Pacific. It seems to bring you home.

"I'm dreaming of a white Christmas . . ."*

The man who wrote that song is an expert at cheering up troops. In 1918, Private Irving Berlin wrote his first all-soldier show, in 1942 his second: "This Is The Army," with which he toured almost every theater of war.

Berlin is also an expert at coming up the hard way. Immigrant to America at 5, on his own at 19, his first song earned just thirty-three cents. But Berlin kept trying: never lost faith in himself or his opportunities.

His hard-working, confident drive is a trait Americans set great store by. And Americans have a lot of it. Which helps account for the fact that our country's Savings Bonds are one of the finest investments in the world.

For the drive of 165 million Americans stands behind these Bonds.

That's why it's such a sound idea for every American—for you—to invest regularly in United States Series E Savings Bonds, and hold on to them.

*Copyright 1942, Irving Berlin.



★ ★ ★

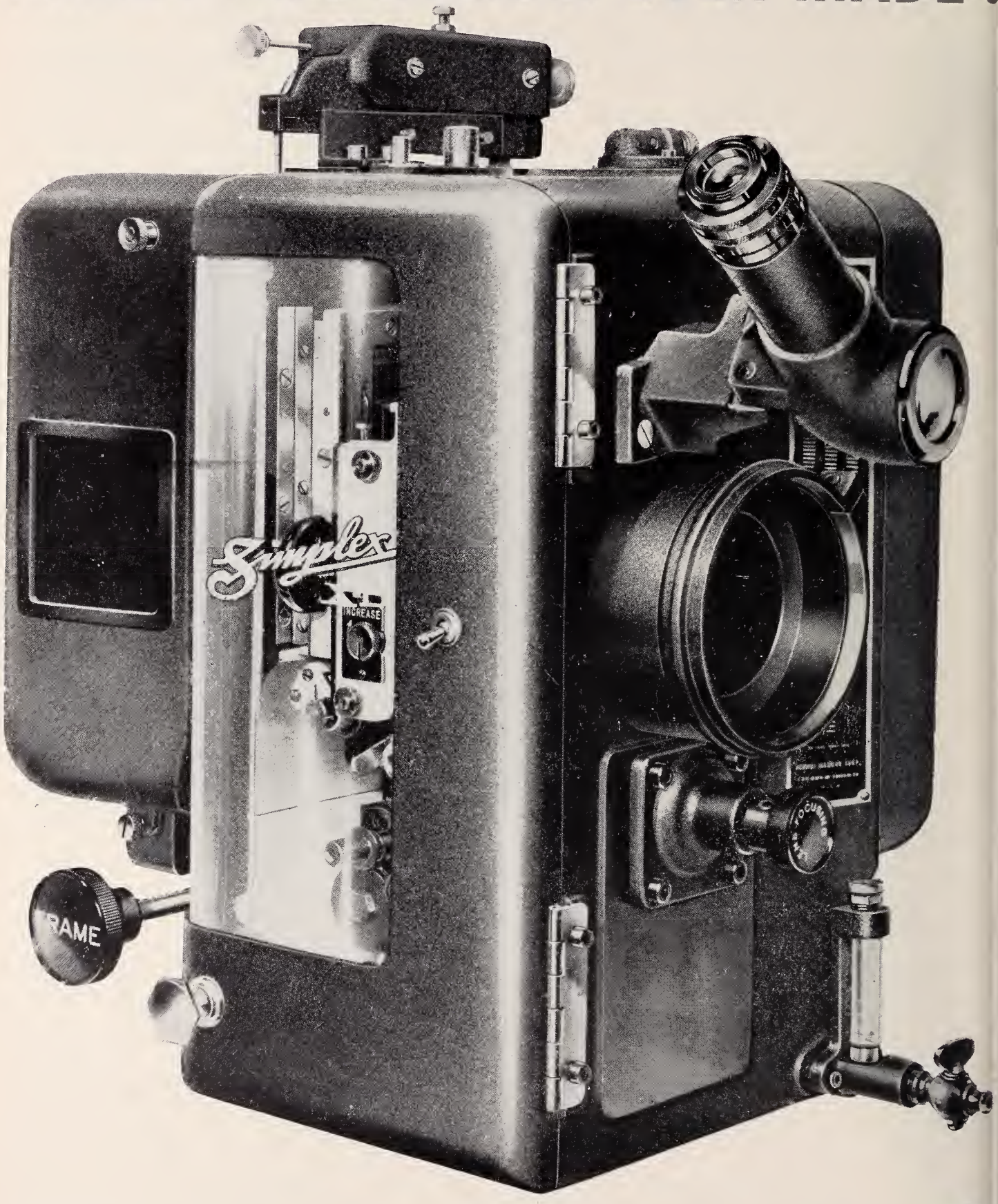
It's actually easy to save money—when you buy Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done *for* you. The Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, when held to maturity. And *after* maturity they go on earning 10 years *more*. Join the Plan today. Or invest in Bonds regularly where you bank.

Safe as America—U.S. Savings Bonds

PUBLIC SERVICE · ADVERTISING COUNCIL ·

The U. S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

FINEST MECHANISM EVER MADE!



MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION • DISTRIBUTED BY NATIONAL THEATRE SUPPLY

SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

B 578649

PROJECTIONIST

INTERNATIONAL

MAR 5 - 1956



FEBRUARY 1956

VOLUME 31 NUMBER 2

30c A COPY $2.50 A YEAR

No lamp in the World!

CAN PRODUCE SO MUCH LIGHT.

Peerless HY-CANDESCENT TRADE MARK REG

CINEARC

NOT A REFLECTOR ARC!

WRITE FOR DATA

Peerless MAGNARC TRADE MARK REG

CINEARC

A 75-77 AMP. REFLECTOR ARC!

22,000 TOTAL LUMENS ON SCREEN

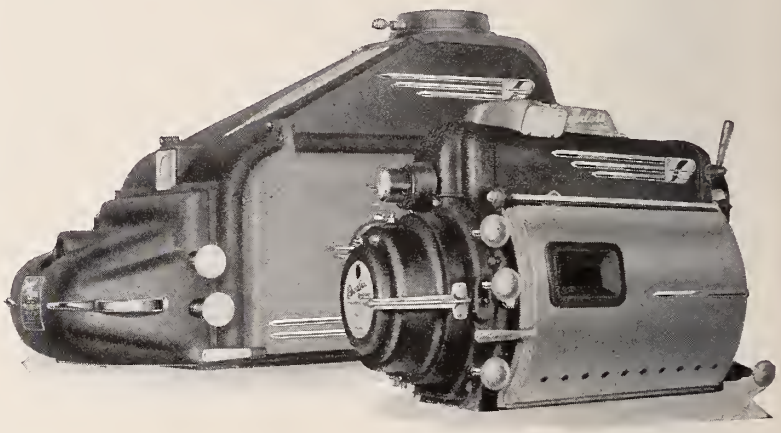
— PROOF —

Hy-Candescents were selected for all **important** "CINERAMA" installations. (Chicago, New York, Los Angeles, San Francisco, Philadelphia, and Washington, D. C.)

Hy-Candescents were chosen by Paramount for **all** Installations of Horizontal "VISTA-VISION".

Hy-Candescents were again selected by TODD-AO for "OKLAHOMA".

You have to do the same if you want all the light there is for big pictures.



At 75-77 amperes . . . With presently available and standard 8 x 9 m/m copper coated carbons . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . With a 14" diameter No. 2012 PEERLESS "Hy-Lumen" glass reflector that retails at a list price of $22.00 F.O.B. Chicago . . . With a No. 2880 PEERLESS Tail Flame Flue . . . On any kind or any size screen . . . No Heat Filter required.

All of this, at the **lowest** possible first, and operational **cost.** And _____

NO-HIGH-RATE *OF ($60.00) REFLECTOR BREAKAGE AND SILVERING DETERIORATION OR HEAT FILTER UPKEEP* !

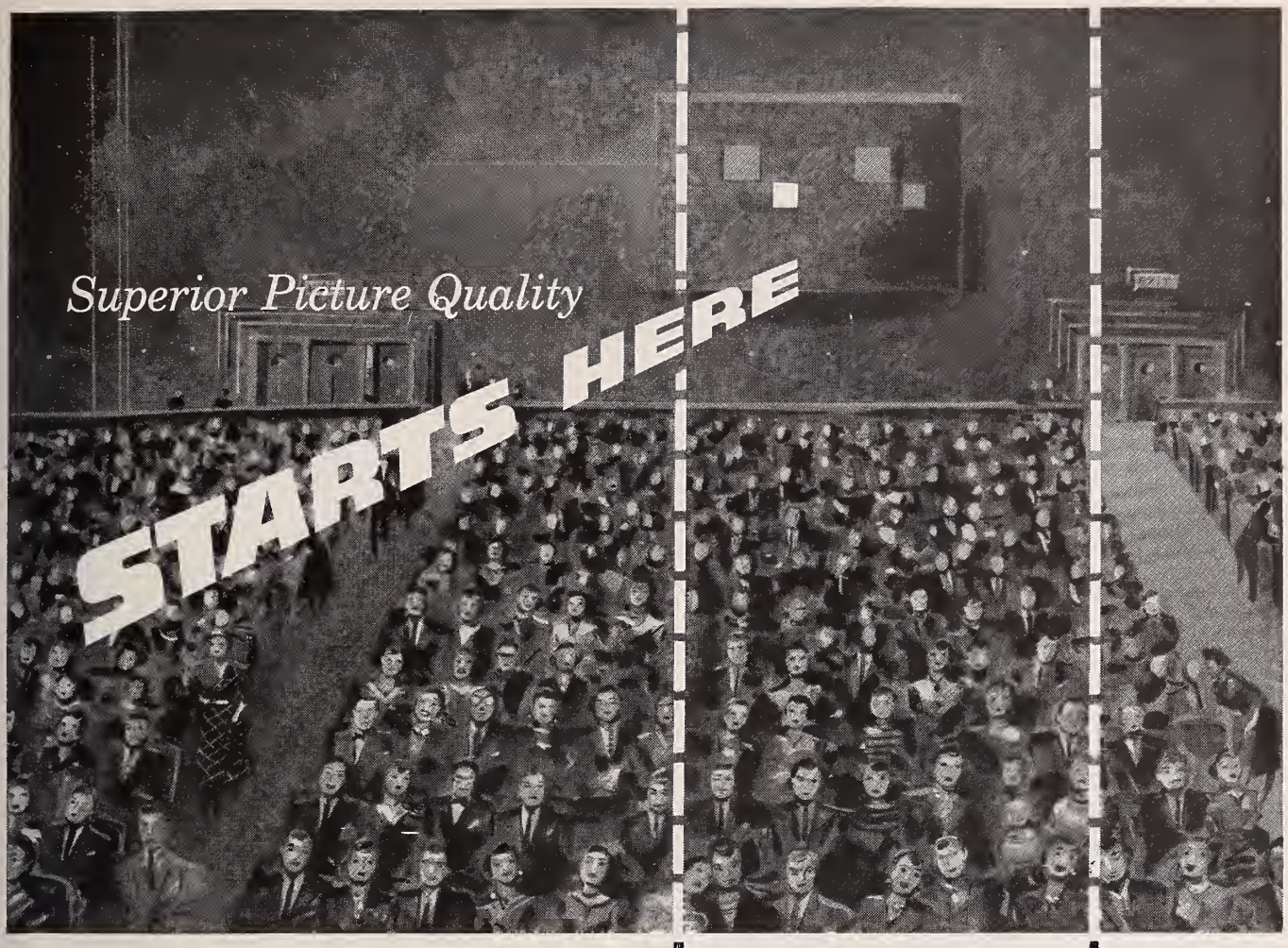
J.E.McAULEY MFG.CO.

552-554 WEST ADAMS STREET

CHICAGO 6, ILLINOIS

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

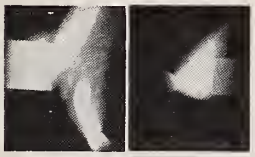
B 578649 FEB 21 1956



when you specify

NATIONAL
TRADE MARK

PROJECTOR CARBONS



THE PICTURE IS LIGHT... GIVE IT ALL YOU CAN WITH "NATIONAL" CARBONS

FOR TWO GENERATIONS of movie-goers, the right carbons—"National" Carbons—have assured the finest possible picture on America's movie screens. And the advantages of "National" Carbons don't end there. This superior picture quality is delivered to the theatre owner at a cost per unit of light and length of carbon burned that is the *lowest obtainable anywhere!*

For highest quality at lowest cost, continue to specify "National" Carbons. It pays in customer-satisfaction *and* in economy of operation.

The term "National" is a registered trade-mark of Union Carbide and Carbon Corporation

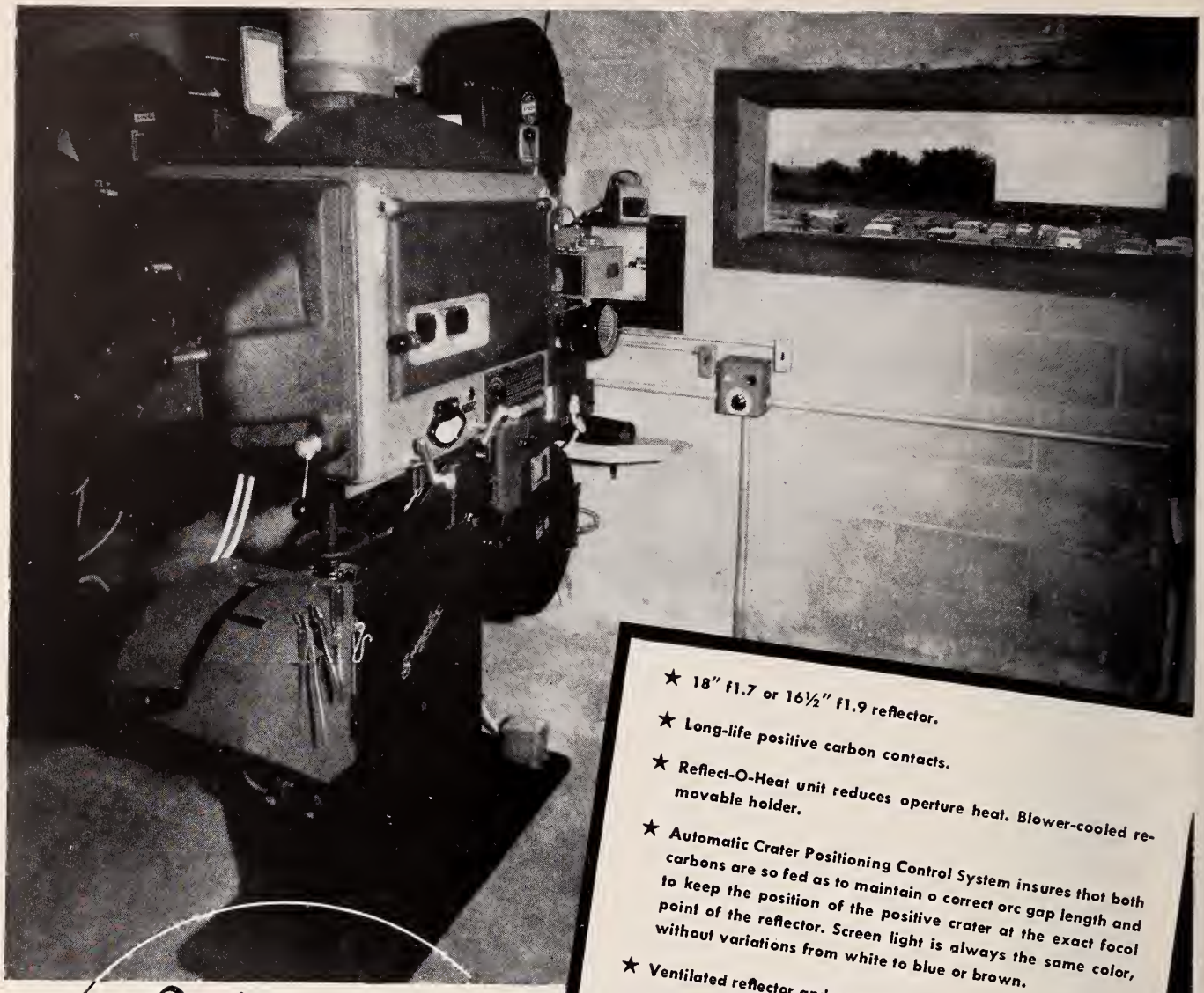
NATIONAL CARBON COMPANY • A Division of Union Carbide and Carbon Corporation

30 East 42nd Street, New York 17, New York

SALES OFFICES:

Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco

In Canada: Union Carbide Canada Limited, Toronto



Pour Plenty of Light Way Out There on those Big Screens!

★ 18" f1.7 or 16½" f1.9 reflector.

★ Long-life positive carbon contacts.

★ Reflect-O-Heat unit reduces operture heat. Blower-cooled removable holder.

★ Automatic Crater Positioning Control System insures thot both carbons are so fed as to maintain o correct orc gap length and to keep the position of the positive crater at the exact focol point of the reflector. Screen light is always the same color, without variations from white to blue or brown.

★ Ventilated reflector and reflector frame.

★ The arc is stabilized by an air jet which also prevents the hot tail flame from reaching the reflector, supplies enough oxygen so that no black soot is produced, and keeps white soot and resultant scum from forming on the reflector.

★ Burn a choice of your carbon trims (9, 10, or 11 mm regular, or 10 mm Hitex). Correct amperage selection is by a single control.

★ Water-cooled carbon contocts (optional).

★ Unit construction permits easy removal of elements for inspection in servicing.

IT'S FROM N.T.S NATIONAL THEATRE SUPPLY Division of National • Simplex • Bladwoth, Inc

EXCELITE "135" PROJECTION ARC LAMPS

★ A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

INTERNATIONAL PROJECTIONIST

R. A. ENTRACHT, *Publisher*
JAMES MORRIS, *Editor*
R. A. MITCHELL, *Contributing Editor*

Volume 31 FEBRUARY 1956 Number 2

Index and Monthly Chat 5
Acoustics in Projection 7
MARK STEVENS
Musical Tones and Acoustics 11
Eliminating Fire Hazards in the Motion Picture Theatre 12
NORMAN WASSERMAN
How Superscope Prints Are Made 14
SMPTE Training Program for the Projection Craft 15
Color and Its Reproduction on Film, III 16
ROBERT A. MITCHELL
Ray Brian — His "Movieana" Archives, VII 18
Cheaper Color Tv Receivers Planned 19
Little Known Facts About VistaVision 19
In the Spotlight 20
Letters to the Editor 22
New Products 24
Personal Notes 24
IA Elections 30
Miscellaneous Items, News Notes, Technical Hints

INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co., Inc., 19 West 44 Street, New York, 36, R. A. Entracht, President. Telephone: MUrray Hill 2-2948. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States and U. S. Posessions, $2.50 per year (12 issues) and $4.00 for two years (24 issues). Canada and Foreign countries, $3.00 per year and $5.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Entered as second-class matter February 8, 1932, at the Post Office at New York, N. Y., with additional entry at Yonkers, N. Y., under the act of March 3, 1879. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Contents copyrighted 1956 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

SE

Monthly Chat

Tv Premiere of "Richard III"

AN EVENT which many projectionists may consider ominous takes place next month when the National Broadcasting Co. will present the Tv "premiere" of the new film version of Shakespeare's play, "Richard III," which was made in color and by the VistaVision process. This British motion picture will attract wide attention in America because of the world renown achieved by its producer and star, Sir Laurence Olivier, for two previous films of Shakespearean plays.

It remains to be seen, however, whether the very considerable group of movie fans eagerly awaiting this film will be much impressed when they see it on their home Tv sets. That kind of viewing cannot compare with seeing this picture in full and faithful color and without distractions on a large screen in a comfortable modern theatre. We have a feeling that many of the home Tv viewers will want to see this film again in the theatre where it can be more fully appreciated for all its power and beauty.

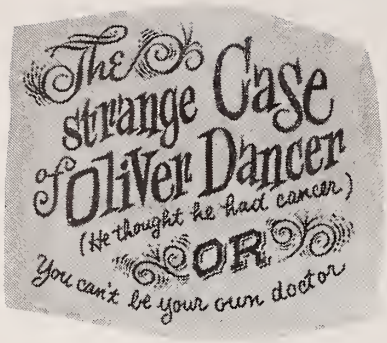
It must be mentioned that the March 11 telecast of "Richard III" will be in color for the small group of viewers who possess color Tv receivers. But this doesn't seem too important because the color telecasts we have seen in the New York area have been garish in hue and so troubled by annoying color ghosts that we doubt the Tv interests will be able to make really effective use of color for some time to come.

Wide-Screen Projection Problems

JUST IN CASE the above leads anyone to sit back and gloat over the fine projection methods now in use, we would like to repeat a story told to us by a member of a social group in a small community. The group often hires a local theatre for a night to put on special films.

On one recent occasion, the picture sponsored by this group was "Mr. Hulot's Holiday," a French film with English titles. At the theatre in question, every picture is shown wide-screen as a matter of policy. The projectionist was required to handle "Mr. Hulot" in the same way. The top and bottom of the frame was masked and the framing mechanism had to be adjusted so as to raise the English titles high enough over the bottom of the screen. The results were terrible. Not only the heads, but portions of the torsos of the actors were cut off at the top of the screen. An article on page 12 of the January issue of IP, "Cropped Titles Create Problems for Wide Screen Art Houses," explains in detail how to overcome this problem.

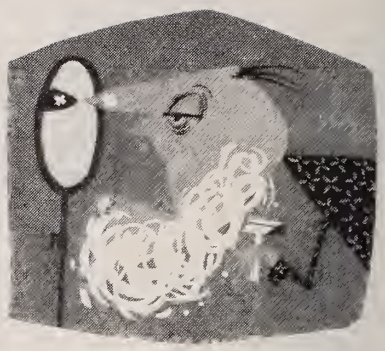
Another type of trouble occurred with the showing of "Marty," an unusual but widely popular film. A complaint from an observer with an explanation will be found in the Letters to the Editor column of this issue. Briefly, the trouble was that "Marty" had been photographed and printed without allowing for the requirements of wide-screen projection. The black-and-white print was so dark that, when greatly magnified by present projection methods, the quality of the screen image in some theatres almost ruined the presentation.



1. This is the story of an ordinary man . . . worked from 9:00 to 5:00 . . . raised hamsters in his spare time . . . steered clear of doctors.



2. Oliver did twenty push-ups every morning . . . took long bracing walks in the fresh air . . . made sparing use of condiments and stimulants.



3. Then one day while he was shaving, he noticed a small lump. An icy hand reached out and clutched at his heart . . . This was it—CANCER!



4. Overnight Oliver became a changed man. He gave his hamsters to a neighbor, bought a small harp and a booklet entitled "Harp-playing for Beginners."



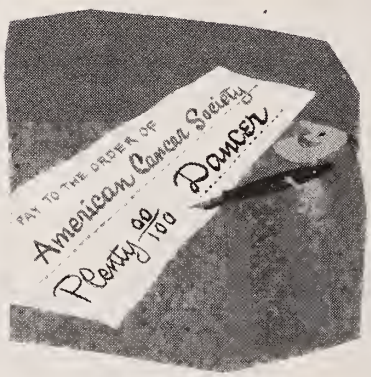
5. Instead of taking long bracing walks, he tottered into his lawyer's office, cut two nephews out of his will and hastily added a couple of codicils.



6. His lawyer, a man of real intuition, knew that where there's a will there's a way, and firmly bullied Dancer into seeing a doctor.



7. A complete checkup showed he was in perfect health, except for a minor tone deafness that would preclude much skill with the harp.



8. Dancer was so overjoyed he promptly went home and made out a very large check to the American Cancer Society, and that's what you should do, too.

AMERICAN CANCER SOCIETY

Gentlemen:

I WANT TO HELP CONQUER CANCER

☐ Please send me free information about Cancer.

☐ Enclosed is my contribution of $ ..... to the Cancer Crusade.

NAME .....

ADDRESS .....

CITY ..... STATE .....

9. (MAIL TO: CANCER, c/o your town's Postmaster.) Help others and help yourself. Fight Cancer with a checkup and a Check.

INTERNATIONAL PROJECTIONIST

VOLUME 31 FEBRUARY 1956 NUMBER 2

ACOUSTICS in PROJECTION

By MARK STEVENS

New equipment, such as a magnetic stereophonic system, will greatly improve a theatre's sound reproduction, but optimum results are obtained only with good acoustical conditions.

DON'T TRUST that monitor speaker! The sound heard in the projection room only roughly resembles the sound heard by the audience in the auditorium. The monitor may be perfect, as such speakers go, — but that makes no difference! The purpose of the monitor is to keep the projectionist informed as to whether or not the sound system is operative. Only the most serious defects of sound reproduction can be heard in the monitor above the whir of the projectors.

The monitor, therefore, must never be accepted as an indicator of sound *quality*. Earphones are better for this purpose, as they permit the lower frequencies of sound to be heard and they shut out the noise of the projectors. But even earphones can do no more than reproduce the output of the system. The audience, listening to the stage speakers, hears a more or less *modified* reproduction of the amplified "signal."

Yes, almost anything may happen to the sound in the auditorium. If the phasing and acoustic balance of the high- and low-frequency speakers are incorrect, the quality of the sound is very seriously affected. Echoes may garble the dialogue, and reverberation may produce distortion. And none of these untoward events is reported by the projection-room monitor!

The ever-changing size of the audience and the noise created by patron movements, laughter, whispering, etc., are tremendously important factors affecting sound reproduction. Such volume must be changed from time to time to compensate for these factors. But how is the projectionist to know if the house is quiet or noisy? A nearly soundproof wall separates him from the people he is trying to please!

Regulating Volume

This is where an auditorium sound observer steps into the picture. By "sound observer" we mean an intelligent listener who has average hearing and a sense of dramatic values. We don't mean the hard-of-hearing patron who complains every time he misses a word, and we certainly don't mean the choleric usher whose nerves fray under the impact of high-level music or sound effects. The projectionist must have absolute confidence in the judgment and diligence of the fellow who listens to the sound and signals for desired changes in the volume.

One buzz for more volume and two for less are the usual signals. If the projectionist really trusts his man Friday in the auditorium, he'll not complain even if the buzzer rings several times during a show. Perhaps noisy children have quieted down, requiring less volume. Or a large party of late-show patrons may have come in, calling for more volume — and less after they have become settled in their seats.

Volume changes should not exceed one point on the fader or potentiometer scale. If the change is not great enough to satisfy the sound observer, he will ring again — a procedure which should be discussed and thoroughly understood by both parties. A buzzer that rings two or three times in a row should not be taken to indicate impatience.

Let's take a look at the stage speakers and auditorium to find out what acoustic conditions may affect the sound reproduction adversely. We shall have to assume that the sound heads and amplifiers are in good working order, and that the sound current impressed upon the voice coils of the speakers is free from distortion.

Modern motion-picture sound apparatus is capable of giving excellent results. Why, then, is the sound so unsatisfactory in a large number of theatres having sound systems of the best quality? Reproduction is sometimes "tinny," sometimes "boomy,"

and dialogue is frequently "fuzzy." In many cases these defects are not sufficiently pronounced to be diagnosed with certainty by anyone except an experienced sound engineer, but patrons sense that something is wrong.

Reproducing Speech

Now, when patrons say that they can't hear everything spoken on the screen, the projectionist, ultimate recipient of such complaints, quite naturally raises the volume level. But this expedient usually makes matters worse: speech becomes even less intelligible, and people begin to complain that the sound is too loud.

We have already said something about audience noises and the effect these have on the required sound volume. The presence of an audience also affects sound reproduction in other ways. A nearly empty theatre is "boomier" and more reverberant than a full one, as well as quieter. As the size of the audience increases, the sound becomes "thinner" and more directional. These annoying transient effects are minimized in up-to-date theatres by the use of heavily upholstered seats. Hard-back seats reflect sound waves rather strongly; and the size and distribution of the audience is thus permitted to modify the quality of the sound in theatres having such outmoded, uncomfortable seating facilities.

The walls and ceiling are more constant factors in the acoustics of a theatre auditorium than is the seating area. These are the areas that receive the lion's share of attention from acoustic engineers. Not only do plain walls of wood, plaster, or concrete reflect a large proportion of the sound energy they receive, causing the sound waves to bounce back and forth for a long time after the original sound has ceased, but they may even vibrate under the impact of sound waves, reinforcing certain frequencies and suppressing others. This alters the relative proportions of harmonic frequencies in tones, making the sound unnatural.

Reverberation Troubles

The acoustical effect of hard walls and ceilings may be appreciated by comparing the sound of a phonograph or radio played out of doors with one played in a large, plain enclosure like an empty garage or railroad-station waiting room. Out of doors there is no reverberation, no resonance, and, in the absence of nearby hills and buildings, no "slap," or echo. Only the source of the sound is heard. But in the large, barren chamber, the reflected waves nearly drown out the source with a barrage of confused noise. Speech loses intelligibility under these conditions because each word continues to be heard while succeeding words are being spoken.

The acoustic conditions that prevail out of doors are said to be "dead," while the reverberant conditions of an echoing hall are termed "bright," or "live." Concert halls are usually made sufficiently live to impart to instrumental music the rich fullness preferred by most people. (Electronic organs, for instance, sound "flat" and colorless when the reverberation circuit is switched off.) Theatres intended for the showing of sound pictures, on the other hand, should be comparatively dead.

A trace of liveness in theatre auditoriums is nevertheless by no means fatal to good sound reproduction. In fact. a certain amount of reverberation without selective frequency characteristics, and without a time-lag noticeable to the average observer, serves to reinforce the sound in a very desirable way, masking directional characteristics and decreasing the amount of sound energy (amplifier output in watts) needed for adequate volume.

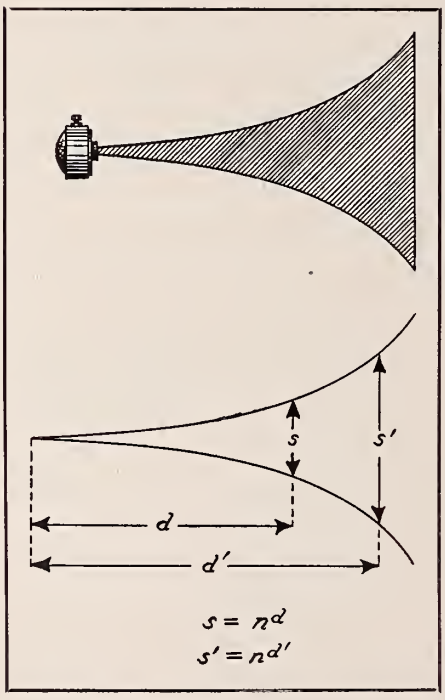


FIG. 1. The design of an "exponential" high-frequency horn is intended to provide the most efficient reproduction of sound. The lowest frequency reproduced by such a speaker depends on the length of the horn, which acts both as a baffle and as a "projector" of sound waves. The term exponential refers to the mathematical equation determining the form of the horn. The width of the horn at any point (s, s') is a function of its length (d, d') operating as the exponent of a constant small number (n).

To be unobjectionable, reverberation must decay at a uniform rate, the reflected sound dying away quickly and without echo. The back wall of an auditorium is usually responsible for any "slap," or distinct echo, that may be heard.

In Older Theatres

Older theatres require a great deal of attention soundwise because very few of them, no matter how painstakingly refurbished with sound-absorbing panels and draperies, are entirely free from acoustic defects capable of ruining even the best sound. Improper positioning of the speakers invariably brings out the worst in such theatres — back-wall slap, ceiling echo, side-wall resonance, etc. The installation of stereophonic sound systems in these theatres, especially if long and narrow in shape, has often resulted in dislocation of the speaker placement formerly used with acceptable results. Reproduction from the stereophonic system may not live up to expectations in acoustically unsatisfactory theatres.

Acoustic treatment of the backstage area is extremely necessary to proper functioning of a sound system. We examine this area first when installing or replacing speaker units. No amount of padding and upholstering in the auditorium can overcome the bad effects of acoustic deficiencies backstage.

Even though modern speaker units are designed to minimize the amount of sound radiated from the back of the speaker, a small amount of "leakage radiation" usually occurs and must be absorbed to prevent the reflection of sound waves from the rear wall of the stage. Sound reflected from this wall and thrown forward through the screen produces interference effects detected as distortion.

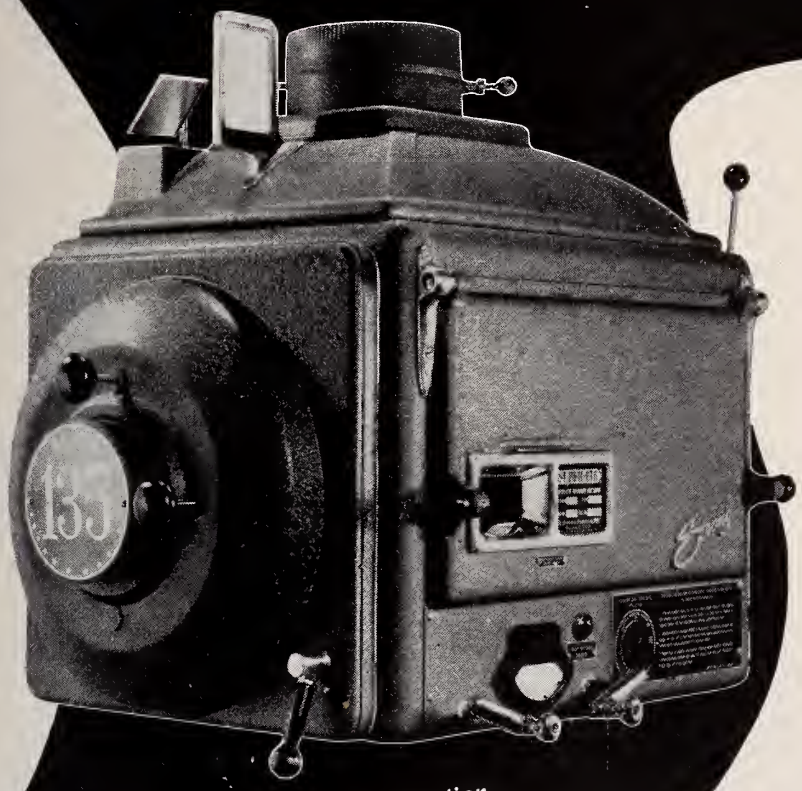
Rock Wool Blankets

Blankets of loosely packed rock wool are effective absorbers of medium- and high-frequency sound even when applied directly to the back wall of the stage. For better absorption of the low frequencies, the rock wool is applied to wire mesh set out from the wall by furring strips. Where this can-

ONLY *Strong* LAMPS

have an

AUTOMATIC ARC CRATER POSITIONING SYSTEM!



A variation in the negative carbon burning rate of as little as 6% to 8% can in 20 minutes change the position of the positive crater in relation to the lamphouse optical system as much as ¼". Less than 1/32" is the maximum error that can be tolerated without a loss of illumination and change in color of the light on the screen to either blue or brown.

The Strong Automatic Crater Positioning System controls the burning of both carbons, maintaining a steady light of constant color temperature—exactly the same for both lamps—so that changeovers need never be noticed.

The new, more complicated projection techniques have greatly added to the demands on the projectionist. He now has even less time for careful attention to the arc.

The Automatic Arc Crater Positioning System, which eliminates the need of hand feeding and correction of the carbon crater position, better enables him to render a good presentation.

If you want perfect projection, you should have Strong modern, efficient reflector type lamps with all their exclusive features. They project the brightest pictures as proven by impartial foot-candle-meter tests.

USE THE COUPON TO GET THE *PROOF!*

THE STRONG ELECTRIC CORPORATION

"The World's Largest Manufacturer of Projection Arc Lamps"

31 CITY PARK AVENUE TOLEDO 2, OHIO

Please send free literature on Strong Projection Arc Lamps.

NAME_____

THEATRE_____

STREET_____

CITY & STATE_____

not be done, two or three thicknesses of heavy velour-type material, preferably black to prevent light reflections from appearing through the perforations of the screen, may be hung in front of the rock-wool padding. The velour should be very loosely draped and separated from the rock wool by an inch or two.

The exact distance from the rear wall to the speaker baffle appears to be unimportant, small changes in this distance having no appreciable effect upon sound quality. The reason is obvious: the frequency range of 50 to 10,000 cycles per second includes sound waves of from 200 feet to 1 1/5 inches in length. It is recommended, however, that the distance from the baffle to the rear wall be somewhat greater than the wavelength of sound at the crossover frequency where both high-frequency and low-frequency units emit about the same volume. For a crossover frequency of 400 cycles, this wavelength is 2½ feet. A baffle-to-wall separation of from 4 to 7 feet is satisfactory.

Assuming that the rear stage wall has been effectively treated with sound-absorbing material, the next step, even before the speaker cabinets are draped, is to make sure that the different speakers have been correctly phased, and that each unit is positioned to minimize the acoustical defects of the auditorium while obtaining the most uniform distribution of sound.

The low-frequency speakers should be connected in parallel, and all should be in phase electrically with respect to each other. That is, the diaphragms of all the LF speakers should move in and out together when energized by the fluctuating currents passing through the voice coils. If these units are PM (permanent-magnet) speakers, there are only voice-coil connections to be considered—two terminals for each speaker. EM (electromagnet) speakers have two sets of connections (four terminals), one set for the voice coil and one for the field magnets. The field-coil terminals are usually coded by + and — symbols, making it easy to "pole" the fields of all LF speakers.

Test Voice-Coil Terminals

Voice-coil terminals, even when number- or color-coded, should be tested to make certain that all connections have been correctly made. If the diaphragms of two speakers move in opposite directions, the sound waves they emit will be 180 degrees out of phase, and most of the volume will be lost in the area where the waves from the two speakers overlap.

Testing the polarity of the voice-coil connections is easy wherever it is possible to reach the diaphragms of the LF speakers from the front of the units. Connect a sensitive DC voltmeter to the low-frequency output leads of the crossover network and depress the diaphragm of each LF speaker by hand, noting the direction in which the voltmeter needle swings. Deflection of the needle should be in the same direction for each unit.

A "listening test" may be used if it is not possible to reach the front of the speakers. Disconnect the high-frequency units and play sound over the system. (Only the bass tones will be heard, of course.) Listen to the reproduced sound while walking from one side of the auditorium to the other, preferably down front near the stage. A "dead spot" of low volume between the two LF speakers indicates an out-of-phase relationship. Reverse the voice-coil connections of only one of the speakers and repeat the test to find out if the dead spot has disappeared.

The high-frequency units must also be in phase with one another; and to test the polarity a voltmeter is connected to the high-frequency output of the crossover network. A sharp blow of the palm of the hand on the orifice of each HF speaker (trumpet removed) serves to depress the diaphragm sufficiently to obtain a deflection of the voltmeter needle.

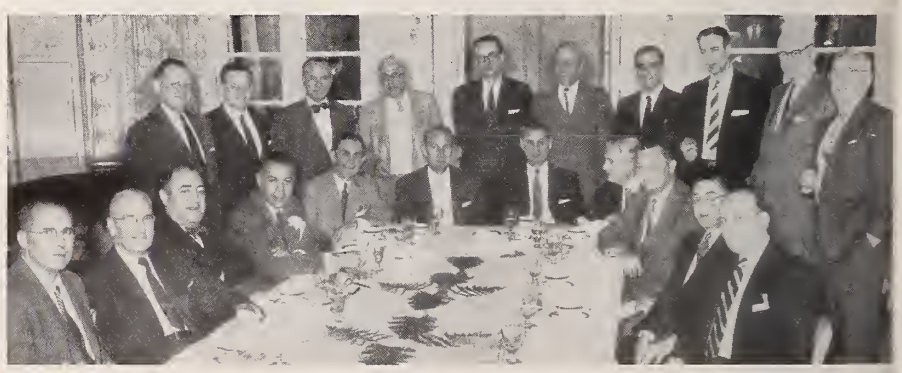
The phase relationship between the LF and HF units depends on the type of HF speakers used and upon their position relative to the LF units. The sound waves emitted by the HF speakers are so short — from 3 feet to about an inch in length — that any change in the distance of a HF speaker toward or away from the plane of the LF-speaker baffle affects the acoustic phasing.

Incorrect phasing of the HF speakers is noticeable to the ear as a loss of volume and sound quality in the crossover range of frequencies (350-550 cycles in most systems). These are the frequencies reproduced by *both* the LF and HF units, all lower frequencies being emitted by the LF speakers alone, and all high frequencies by the HF speakers alone. In phasing HF speakers we are concerned only with the crossover frequencies, for phase relationships have no effect on the sound of tones consisting of a low "fundamental" and a number of higher "harmonics."

Instructions Differ

Some manufacturers of theatre sound equipment instruct that the HF units should be in phase electrically with the LF units; others state specifically that the two units should be electrically 180 degrees out of phase. The manufacturer's instructions should

PLANNERS OF INTERNATIONAL PROJECTION EQUIPMENT SHOW



The boards of directors of Theatre Equipment and Supply Manufacturers Association and Theatre Owners of America lunched together at the Sheraton Astor Hotel in New York City on January 10th to discuss plans for the International Trade Show, Fair and Exposition to take place next September at the New York Coliseum. Those present, left to right (seated): Larry Davee, M. H. Stevens, TESMA; Herman Levy, TOA general counsel; Walter Reade, Jr., former TOA president; William A. Gedris, TESMA; Lee Jones, TESMA president; Myron Blank, TOA president; Merlin Lewis, TESMA executive secretary; Horace Denning, TOA vice-pres.; Robert Livingston, TOA secretary; Joe Alterman, TOA. Standing, left to right: Carl Anderson; Albert Pickus, Pat McGee, and Julian Brylawski, TOA vice-presidents; George Gaughan, TOA field representative; Ernest Stellings and George Kerasotes, assistants to the TOA president; Tom La Vezzi, TESMA vice-pres.; V. J. Nolan and Joe Fetherston, TESMA.

always be followed.

After the speakers have been connected and correctly phased *electrically*, sound should be played and the HF speakers moved toward and away from the screen until the best quality of sound is obtained in the auditorium. If it is found that the best position of the HF speakers is such that their trumpet mouths are more than a foot behind the plane of the LF baffles, reverse the HF voice-coil connections and move the speakers nearer the screen. A half wavelength in the crossover-frequency region ranges from 12 to about 21 inches, indicating the distance these speakers will have to be moved if the leads are reversed. If they are too far from the screen, annoying sound reflections may be produced.

This procedure is absolutely necessary to bring about the most satisfactory acoustic phasing of the LF and HF units. As a final test, a recording of heavy male speech should be played. This type of sound is very rich in the frequencies included in the crossover range. If all is well, actors will seem to be speaking from the surface of the screen rather than from some point behind it, and medium-frequency sounds will be clean and clear. The HF horn-sled or cradle should then be fastened securely to the LF horn or speaker cabinet.

Pick up all tools and screws, etc. which may be lying on the speaker cabinets. Loose objects will vibrate under the impetus of powerful sound waves and create rattles in the sound.

Backstage Acoustics

This done, attention should once again be directed to backstage acoustics. Even when the rear wall of the stage has been covered with sound-absorbing material, draperies of black velour or heavy black velvet should be applied to the back of the screen, acoustically isolating the backstage region from the auditorium except for the horn mouths. The velour is draped loosely over the back of the speaker units, but preferably not touching them.

This expedient improves the performance of the HF speakers, and any drapery at the back of the LF units is unnecessary except that it absorbs back radiation from the HF units. Low-frequency sound waves not only penetrate many materials that effectively absorb high-frequency vibrations, but, being less directional, low-frequency waves go around corners with comparative ease. Satisfactory reproduction of the lower frequencies depends largely on the overall acoustic characteristics of the auditorium.

At this point the sound-service engineer may wish to put the finishing touches on the tonal balance of the system, adjusting the frequency response by means of the degenerative-feedback network of the amplifier and listening to a series of pure tones reproduced from test films. But if the acoustics of the auditorium are unusually bad, final adjustment of the frequency response may be deferred until every possible effort has been made to kill troublesome echoes and reverberations.

The auditorium, unless specifically designed and treated for the reproduction of sound pictures, may present almost insuperable difficulties to the installation engineer. It is not always possible to obtain uniform distribution of sound in many of the older theatres having balconies without at the same time allowing the poor acoustics of the theatre to ruin the naturalness and clarity of the reproduction.

Old-time theatres designed for movies exclusively tended to be long,

(Continued on page 32)

Musical Tones and Acoustics

THE FUNDAMENTAL frequency of a musical or voice tone usually determines the pitch, the harmonic frequencies provide the characteristic timbre, or "tone." A sound system capable of level response from about 30 to about 10,000 cycles per second will reproduce the higher harmonics and provide natural sound with lifelike brilliance. Attenuation or exaggeration of certain frequencies makes the sound unnatural by altering the relative intensities of the fundamental and harmonics.

Meaning of Harmonics

The keyboard shown in Fig. 1 reveals the musical pitch of the various harmonics when "C" is the fundamental. (The 7th harmonic is omitted because no keyboard note corresponds to it.) A sound having few harmonics is "dull;" one rich in harmonics is "brilliant."

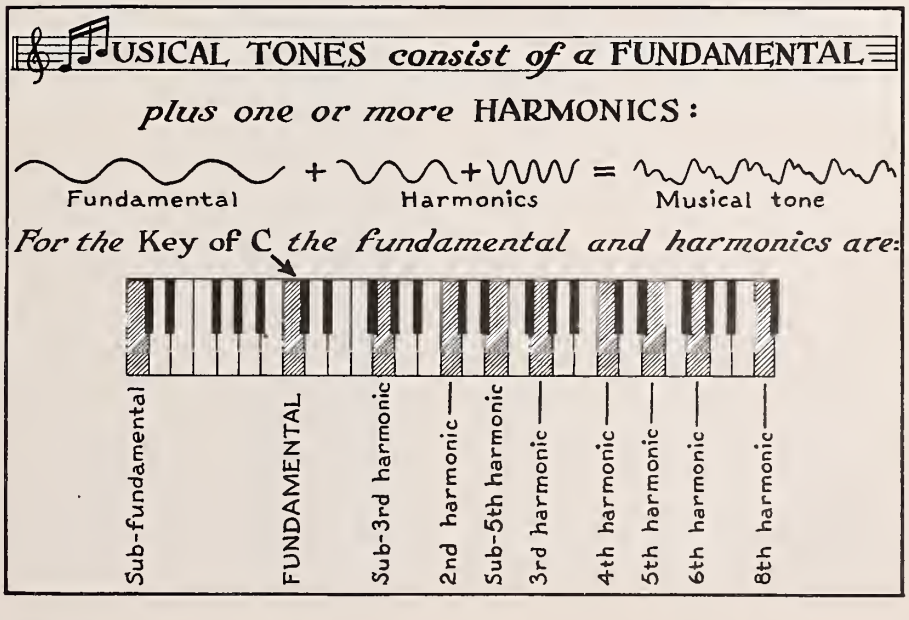
The 2nd, 4th, and 8th harmonics are called "consonant" because they are 1, 2, and 3 octaves, respectively, above the fundamental, and thus are consonant with "unison pitch." These harmonics result in a fluty quality of tone.

The sub-3rd, sub-5th, 3rd, 5th, and 6th harmonics (various E's and G's on the keyboard) are called "dissonant," and predominate in reedy and string-like tones. The sub-fundamental (the C below fundamental C) imparts a deep, resonant quality to tones. When the sub-fundamental is as strong as the fundamental, it assumes the character of a fundamental and lowers the pitch of the tone one octave.

The theatre pipe-organ, mightiest of instruments, is noted for the range and variety of its tones. The harmonic con-

(Continued on page 34)

FIGURE 1



Recent inspections uncovered many violations in New York City. The story is covered here from the point of view of the projectionist.

Eliminating Fire Hazards in the Motion Picture Theatre

By NORMAN WASSERMAN

ALONG with a gay and festive 1955 Christmas season in New York City, bringing thousands of happy holidayers into the stores and restaurants, and especially the theatres, came another note that was not so happy from the N.Y.C. fire department. The sobering note struck by the fire department was a warning to theatres — preceded by a flash inspection — to get rid of all fire violations or get closed down.

On Dec. 19th, teams of fire inspectors surprised the busy midtown theatre area by charging from one to four violations to 17 theatres out of 39 they inspected during the day. The surprise inspections continued throughout the following day, but they were less of a surprise, as only two out of 20 theatres in the same area were found to have violations. There was evidence in nearly all of the theatres visited the second day that the inspections were anticipated and potential violations hastily rectified.

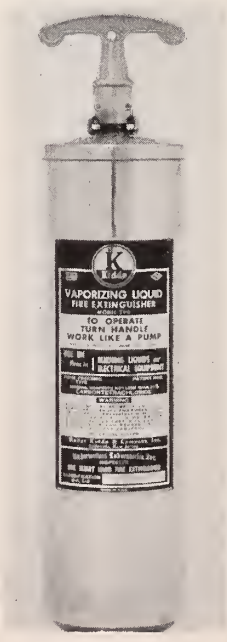
Lack of Responsibility

Commenting on the first day's findings, Fire Commissioner Edward F. Cavanagh, Jr., said they indicated a "disgraceful lack of responsibility on somebody's part for the safety of patrons of the places where violations were found."

The clean-up drive continued right through and beyond Christmas, covering a good portion of the city's 400 motion picture houses. Offenders were given 24 hours in which to correct the reported violations, or else be shut down.

In view of the fact that offenders were not punished (the fire commissioner promises strict prosecution in the future), it became apparent that the drive was aimed at bringing to light the multiple potential dangers of fire in theatres. The point was made doubly effective by the timing of the inspections, during the holiday season when theatres were jam-packed with patrons.

On the other side, theatre owners voiced indignation, proudly claiming an excellent safety record. The fact is that New York theatres do have an excellent safety record. Not a single member of the paying public has lost his life in a theatre fire during the last forty years. Fires, however, have a tendency to be unmindful of records; it only takes one bit of a blaze to turn any record into ashes.



One quart carbon tetrachloride fire extinguisher. Carbon tet will not conduct electricity and therefore can be used on electrical fires as well as fires caused by inflammable liquids. The above model is capable of a stream 20 to 30 feet in length.

Panic Costs Lives

For the record, anyway, estimated figures for the nation arrived at by the National Fire Protection Association show a total of 1,800 fires in theatres, including motion picture theatres, in 1954. Losses amounted to $4,500,000. However, the estimated grand total of fires of all kinds that year was 1,993,300 with $1,016,915,000 losses.

The seriousness of fire and potential fire can only truly be measured in terms of human life. It is here that the role of the theatre as regards fire becomes greatly magnified. When you have something like a thousand people, more or less, seated elbow to elbow inside of one dark auditorium, fire can be disastrous. Not only can the fire itself bring destruction, but there is also the danger of panic. As a result of a recent theatre fire in India where safeguards may not have been very thorough (ironically the picture being shown was for the purpose of education), no less than 300 people were either burned or trampled to death.

Of course, measures should be taken to prevent all fires everywhere. Yet it is apparent that in places where there are greater concentrations of humanity — namely, public buildings — greater concern should be exercised. It is interesting to note that estimated NFPA figures for 1954 show 5,300 fires in schools and colleges, 4,300 fires in churches, 4,000 in amusement places, while government buildings, hospitals and institutions, and theatres all ranked about the same, approximately 1,800.

A word here about the National Board of Fire Underwriters. The NBFU has developed an extremely reliable national code covering every conceivable type of electrical equipment and installation. Based on the findings of the Underwriters' Laboratories, the largest single organization engaged in fire prevention research, the code is used nationally as a safety guide by federal, state and municipal authorities. The majority of insurance companies insist on the UL label for all electrical apparatus in motion picture

theatres and elsewhere.

M. D. O'Brien, director of projection and sound for Loew's Theatres, who has written extensively on the subject, makes the following interesting point regarding local adapatation of the national code. In many areas officials lacking the knowledge and experience of the NBFU have still seen fit to amend or add to the code and establish their own standards, often with very peculiar deviations. This leads to such wide divergence of operation procedure that theatre men frequently find it difficult to perform in exactly the prescribed manner of a specific locality, not to mention the economic adjustment to be made. O'Brien favors a national standardization program, using the most exacting scientific fire safety research available, for all motion picture theatres.

IP studied the reports issued by the fire department on the New York inspections in an attempt to determine the role of the projectionist in regard to the violations found. Actually the majority of the violations were completely outside the projectionist's domain. Projection rooms, on the whole, were in fine shape. On the other hand, the most serious violation of the recent drive was the reported finding by an inspecting team of a can of "highly flammable oil stored alongside films."

As an example of the type of violation found outside the projection room, one large theatre alone was ordered to: "place pressure gauge on fire pump in proper working order; remove all combustible matter from near stage; remove all empty paint cans from storage room on second floor and replace all paint and varnish on metal shelves."

Typical Violations

A breakdown of all the violations charged disclosed that the sources of trouble varied from alleyways, to corridors, to backstage, projection rooms, storage rooms, and exits. With such diversity of area, it is apparent that only the general manager of a theatre can see to it that everything is in tip-top shape. The general manager not only has a moral responsibility, but along with the theatre owner, a legal responsibility as well, to take every necessary measure to insure the safety against fire of his patrons and the staff, not to mention property and equipment. It is the duty of the manager, among other things, to conduct a fire drill with the other employees once a month, to see that all equipment is in safe operating condition, and not to allow dangerously damaged film to be run.

Overall theatre surveillance is an absolute necessity because fire and panic in theatres tend to spread rapidly. Readers of IP's December *Spotlight* page will remember the description of the disastrous Sydney, Australia, theatre fire, in which projectionist Ivan Bailue was burned. This fire started behind the screen, but within minutes swept across practically the entire theatre. At the time, one of the projectors contained a reel of highly combustible nitrate film. Fortunately, however, the projection room was the least damaged part of the theatre.

Nitrate film has now been almost wholly replaced by safety acetate film in the U. S. Approximately only 1% or less of all film shown here is nitrate. Accordingly, there has been a definite decrease in the number of projection room fires with film as the cause. The dangerous nitrate base ignites under intense heat and emits clouds of panic-provoking poisonous smoke. Safety acetate film, on the other hand, burns about as quickly as paper.

The tremendous reduction in film fires, since the widespread use of acetate film, was strongly emphasized by Harry Rubin, in charge of projection at Paramount theatres. He pointed to the rarity of projection room fires with film as the cause where safety film is used. Rubin also offered the idea that fire potential is greater in the more spacious areas of a theatre, such as backstage, where a large amount of clutter can gradually accumulate. The projection room, being the small size it usually is, must be kept tidy and clear for the sake of mobility, as well as safety.

However much the ultimate responsibility lies with the manager to safeguard the theatre against fire, every person in a theatre at any time can do his part. This includes everyone right down to the ushers and usherettes, as well as the patrons themselves. Of prime importance here is the projectionist, for his domain consists of a heavy concentration of electrical apparatus. (Electrical causes accounted for an estimated 94,100 fires in all buildings in the U. S. during 1954, with estimated losses amounting to $95,400,000). It is for his own safety as well as everyone else's that the projectionist should follow all precautionary measures.

Precautions in Projection

In reply to a special request by IP, New York City Fire Commissioner Cavanagh listed the precautions to be observed by projectionists. Although the precautions contained here relate directly to the fire laws of New York City, they can very well serve as guides for projectionists everywhere. It should be borne in mind that as long as nitrate films occasionally go out of

Tender (Fire) Trap

While conducting deep research for the accompanying article, IP (I is truly for *International*) discovered that the New York City fire department was not the only such agency making thorough theatre inspections of late. In Japan, theYamaguchi City fire department recently uncovered what is probably the most unique and debatable "fire hazard" in the motion picture theatre world.

It seems that the promotion-minded proprietor of the Zinzen-za Theatre in this western Honshu city had installed what he termed "romance seats" way back in the rear of the auditorium. There were a half dozen of these to be exact, each six feet long, each partitioned off into a small cozy compartment, the door of which could be locked from the inside. A curtain was also provided in front which could be lowered, should the activity on the screen be too distracting. In addition, the investigating team found that the romance divans had been equipped with a pillow by the considerate management of the Zinzen-za.

When queried by the fire department, the manager had a ready explanation: "Considering the structure of our establishment, lighting conditions and acoustic problems, we installed bed-like seats."

Officials of the fire department, however, were not completely satisfied. Said they, "We still cannot decide whether the romance seat constitutes a fire hazard."

When the department of building construction was called into the case, an officer in charge of permits announced: "There is a clause in the book to prohibit the seats," while a spokesman for the police volunteered, "We must study the question deeply."

exchanges, the utmost care must be taken. It is very probable that when acetate film becomes the absolute standard, fire prevention rulings as well as insurance rates will be relaxed. As prescribed by the commissioner, following is a list of points to be watched in the projection room:

1. No smoking.
2. Portable appliances at each projection machine:
   (a) Two pails of sand
   (b) One carbon tetrachloride extinguisher
   (c) One receptacle with self-closing cover containing water for film scrap
   (d) One receptacle with self-closing cover for paper, scrap, etc.
3. Electrical hazards:
   (a) Frayed or worn wires or cables
   (b) Improper sized fuzes
   (c) All wiring shall comply with the N. Y. C. Electrical Code and be approved by the Department of Water Supply, Gas & Electricity.
4. All furniture and fittings shall be of incombustible material; except the chair seats and tables and floor coverings, which may be of slow-burning material.
5. Shutters protecting window opening for each machine shall be arranged to close automatically in the event of fire, by operation of approved fusable and manual releasing devices. Shutters must be kept clear of all obstructions and in proper working condition at all times.
6. Self-closing doors to be kept unobstructed and in proper working order.
7. Film storage in approved containers and only in approved projection and storage rooms.
8. Projectionists to set up and follow an orderly procedure in the event of fire within the projection room, to keep fire from escaping outside the room.

An interview with Lieut. Thomas Leahy, division of fire prevention, who supervised the actual theatre inspections in New York City, disclosed that the most common causes of projection room fires are: smoking, faulty wiring, and improper use of receptacles. He emphasized that there should be no smoking where there is any film. Receptacles should be kept closed and the proper material discarded into them. Wiring and equipment should be checked periodically. Hot carbons should be placed into a suitable container immediately after use. All film should be examined for torn sprocket holes and other damage that may disrupt the free passage through the projector. Also, clothing should be kept outside the actual projection room.

In addition, it was pointed out that the automatic fire shutters of projectors must be in perfect working order. There should always be water in the film scrap receptacle. Port Fire shutter operation should be flawless. Doors to projection rooms should be kept closed at all times, and no unauthorized person allowed to enter. The proper place for repairing film is the rewinding room, or else in a separate part of the projection room set aside for that purpose. When film is transported, it should be done so in I.C.C. containers.

Projectionists should certainly familiarize themselves with the care and operation of the available fire extinguishers. One of the most common kind is the one-quart hand pump using carbon tetrachloride (CTC). Operation is very simple: it is held in one hand and pumped by a handle with the other; air pressure forces the fluid out in a strong stream. Care should be taken to prevent excessive carbon tet from touching the skin. Extinguishers should be inspected once a month and kept fully charged at all times.

Very often the storage of film in theatres becomes a problem. Lt. Leahy supplied the following list of limitations governing the storage of both

(Continued on page 31)

How Superscope Prints are Made

The "Superscope" anamorphic printing process is now being used by RKO studios for some release prints. The advantage of this process is that it provides the studio with a relatively inexpensive method of providing both anamorphic and non-squeezed widescreen prints to theatres.

According to studio cameraman, Wilfrid Cline, photography for Superscope requires only standard cameras, lenses and set lighting arrangements. This is in contrast with the special set requirements and heavier lighting equipment often needed when anamorphic camera lenses are employed. It is only in the making of Superscope release prints that changes take place.

A system of printing lenses was designed for the Superscope process that can be installed on any laboratory printer for the purpose of taking a standard camera negative and printing it in any aspect ratio within 35-mm limitations. The process will turn out anamorphic prints from straight 35-mm negatives. If desired, this printer can also provide prints from big negatives such as those employed by Paramount for the VistaVision system.

The three prints in the accompanying illustration show how the Superscope system works. At left is a standard contact print made from a standard camera negative. By masking this print top and bottom with the proper-sized aperture plate, it can be employed for wide screen projection. At center is shown a specially-masked print on which only the area of the picture to be used in making the anamorphic print appears. At right is shown a Superscope anamorphic print. This print has the unusual frame size of 0.715" x 0.715", making it absolutely square. Unused area of the print can be seen between the right edge of the frame and the sprocket holes. The expansion ratio of this print is 2 to 1, the same as CinemaScope. However, since the frame proportions are square, the result is a 2 to 1 picture on the screen, rather than the 2.5 to 1 picture provided by a CinemaScope magnetic print.



Courtesy, American Cinematographer

FIG. 1. Original scene as photographed with conventional Mitchell camera.

FIG. 2. Composition used by laboratory in making Superscope print.

FIG. 3. This is the resultant Superscope anamorphic print — area .715" x .715".

SMPTE Training Program for Projection Craft

A COMPREHENSIVE training program to aid projectionists in getting the most out of the new film processes is now being planned by the Society of Motion Picture and Television Engineers. The final format of this training program has not yet been decided on, but according to Boyce Nemec, executive secretary of the Society, it will be "thorough and carefully planned," and it will be "available to every projectionist in the United States who wants to add to his knowledge."

At its quarterly meeting in New York late last month, the board of governors of the SMPTE supported a proposal by Dr. John G. Frayne, president, that a projectionist training program get under way. He based the need for the program on the large amount of new and complicated equipment introduced during the past few years, and stated that information must be made widely available on the principles behind wide-screen and multi-channel sound systems.

A committee of theatre equipment experts is now being appointed by the SMPTE to study the educational needs of working projectionists and to discuss methods of filling these needs with leaders of the projectionist craft. Methods already proposed for providing information include instructional films utilizing the latest in training methods, printed manuals, and lecture outlines accompanied by color slides or slide films to illustrate the points under discussion.

It has also been suggested that the best classroom and laboratory for the course which the SMPTE is planning to sponsor, would be well-equipped theatres throughout the country. There projectionists from a locality could get together, maybe a couple of hours before the first show, and observe points in a lesson demonstrated by experts. Projection and sound problems, and methods of correcting them could be pointed out clearly to everyone present by demonstrations on the theatre's equipment. Special films and slides presented on these occasions would make the lessons doubly clear and instructive. When the courses get under way, it is expected that IA Locals will play an important part in the arrangements.

The training program for projectionists will actually be the fourth of a series of courses sponsored by the SMPTE for motion picture industry personnel. Three courses on optics and laboratory practice for studio technicians began at the University of California in Los Angeles last fall under the joint sponsorship of the society, the University, and interested labor organizations.

Dr. Frayne, who has provided the leadership for the entire SMPTE technical training program, credits an editorial, "SMPTE Courses Point the Way," that appeared on page 5 of IP's November issue with helping him to decide that projectionists needed training and guidance in order to do their job properly in this time of change.

Readers of IP will be most interested in hearing about the final form of the SMPTE educational program for projectionists. The committee studying the situation will submit an outline at the next meeting of the Society's board of governors on April 29, and final recommendations at the board's July meeting. Shortly afterwards actual preparation of the course for projectionists should be under way. Details will be reported in IP as soon as available.

How Free Is "Free" Tv?

There has been much talk around about the wonders of "free" television. One of the wonders least talked about is that it is not free. Somebody pays for all those commercials and when you get right down to it — it's you.

Projected estimates formulated by the J. Walter Thompson Agency reveal that advertising expenditures in the U. S. have soared from $3,600,000,000 in 1940 to $8,800,000,000 in 1955, with millions and millions going toward Tv. In 1950, the figure was $5,700,000,000. This means that advertisers spent $53 on each of 165,000,000 American citizens in 1955 to influence him in a certain way, compared to $38 spent per capita in 1950, and $16 in 1940.

Where does the money come from? The answer is simple. It works this way: every time you go to the store with "knock, knock for Knick--" or something else running round your head, and then act on it, it helps a manufacturer meet his advertising budget. If enough people "knock, knock for Knick--," well, that's what makes up Steve Allen's paycheck.

Test Films from SMPTE

A new catalog listing the test films that are available through the Society of Motion Picture and Television Engineers may now be obtained by application to SMPTE headquarters in New York City. As standard tools of inspection, the test films are very useful to designers and manufacturers in setting up performance objectives and determining results.

These films, specially planned by SMPTE technical committees, now include ten 35-mm magnetic four-track CinemaScope films which provide a full series of sound and picture tests for wide-screen use. For regular 35-mm film, there are focus-and-alignment, travel ghost, and jump-and weave tests.

In the 16-mm field, there are films for testing magnetic azimuth alignment and for multi-frequency tests.

Also listed in the new catalog are films which may be applied to television testing. These include 35-mm and 16-mm alignment and resolution films and some very recent 35-mm and 16-mm color test films and slides.

Kodak Education Grants

The Eastman Kodak Co. has added about $300,000 to its aid-to-education plan to benefit colleges whose graduates are employees of the company. To qualify for a grant, an institution must have at least two graduates employed by Kodak for a period of at least five years. The grants offer payments to the colleges of $500 for each year the employee studied at the college, provided he completed a regular and established degree program.

Color and Its Reproduction on Film

By ROBERT A. MITCHELL

All factors which contribute to high-quality color projection are thoroughly explored in the third and final installment of this article. Getting the most out of color prints has become a vital part of the projectionist's job in the wide-screen era.

COLOR FILMS used for theatre movies at the present time may be divided into two main groups: imbibition (dye-transfer) prints and multilayer (dye-coupler) prints. The old "duplitized," or double-coated, type of color film has practically disappeared from the field.

Imbibition prints are made by transferring colored dyes soaked up by the gelatin relief images of specially prepared "matrix" positives to blank release-print stock. Three successive printings are necessary, one for each primary color involved in photography. The printing dyes are complementary in color to the primaries, the blueviolet image being printed in lemon, the green image in magenta, and the red image in cyan. The blank printing stock is ordinary 35-mm positive having only a sound track and framelines in developed silver image.

Least Expensive Method

The imbibition process, employed exclusively by Technicolor, is the least expensive way to make color motion-picture prints. Complex equipment operated by specially trained operators is required.

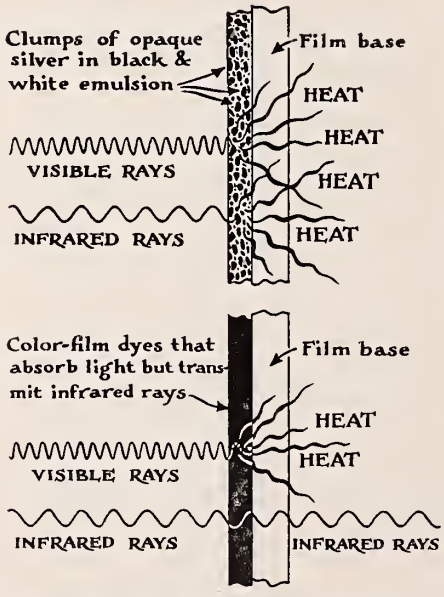
Multilayer dye-coupler color films have the color "built in." Coated with three very thin black-and-white emulsions, each containing dye-forming chemicals and sensitized to only one of the three primary spectral colors, this type of film is printed from reversed-color negatives and developed in much the same way as ordinary film. The silver image formed in each of the three layers is bleached out during processing after the corresponding dye-image has been formed by chemical action.

The sound track and framelines are printed in the color emulsion-layers, hence require no special treatment as in Technicolor. (Technicolor printing dyes are too transparent to "low red" and infrared wavelengths, and give images too blurry, to allow the use of dye-image sound tracks.) Eastman Color, Ansco Color, and Agfacolor are among the most widely used multilayer color films. Eastman Color is frequently issued under trade names given it by producing companies and processing laboratories.

Technicolor imbibition prints may easily be distinguished from multilayer color prints on casual inspection by the appearance of the framelines. These are printed in silver image in Technicolor films, and are light gray in color. The framelines of multilayer films, on the other hand, are so dark as to look almost black.

Technicolor Sound Tracks

The sound tracks on Technicolor prints are exactly similar in appearance to those on black-and-white prints, while those on multilayer prints are often much darker, and sometimes have a blueviolet tinge. (Very rarely they have an all-over amber tint.) Viewed by reflected light at a large angle of incidence, the picture images on most multilayer color films appear slightly more embossed than those on Technicolor imbibition prints.



Both visible light and invisible infrared rays are absorbed and converted into heat by the opaque silver particles of black-and-white emulsions. The dye images of color films, on the other hand, transmit the infrared radiation and are heated by the visible rays alone. Color prints are accordingly able to withstand arc currents that would blister the emulsion of monochrome prints.

Scraping the emulsion very carefully with a sharp knife or razor blade in a dark area of the image reveals another difference between multilayer and imbibition films. As the emulsion of a multilayer film is scraped, the top magenta-image layer is removed first, leaving a green image. Further scraping removes the cyan layer, leaving the lemon (actually yellow) emulsion.

Similar careful scraping of the emulsion of a Technicolor film removes all colors at the same time, resulting only in a faded image. There are no separate color layers, for the three dye images are printed on the gelatin coating of regular positive stock. But when Technicolor film is soaked in a hot solution of baking soda, the magenta dye diffuses much more readily than either the cyan or lemon; and scraping will then reveal a magenta image which has penetrated the gelatin completely. This does not happen with similarly treated multilayer films.

Projection Characteristics

Notwithstanding these slight physical differences, the picture images on both imbibition (Technicolor) and multilayer (Eastman Color) prints are *dye images*, no silver being present. In projection, therefore, both types of color film behave very nearly the same —a behavior noticeably different from that of black-and-white film.

The silver images of black-and-white prints absorb *all* wavelengths of radiation about equally. These images are composed of microscopic clumps of opaque silver that absorb all wave-

lengths, converting them into heat—heat that raises the temperature of the emulsion. In the dark areas of the photographic image, therefore, the infrared "heat rays" of the arc beam are stopped as effectively as the visible light rays are.

Less Heat Absorbed

The dye images of color films behave differently. They absorb visible wavelengths selectively, transmitting some and absorbing others, depending on the color. All of the colored dyes are transparent to infrared radiation, however. Even in areas of maximum density (the deepest black in the pictures), Technicolor imbibition images transmit about 90% of the infrared, and multilayer images about 60%. Infrared rays that are transmitted are not converted into heat.

It is a matter of interest that Technicolor dye images are even transparent to the longest visible wavelengths. Viewed by red light of from 750 to 780 millimicrons in wavelength, the densest Technicolor images look very pale and "washed out." The images on multilayer films look much less pale when viewed by "low red" light, and the presence of a silver image in the redeveloped sound track is revealed by its opacity. The cyan dye is the most effective in absorbing red light.

The transmission of invisible infrared rays by dye images is extremely important to projectionists who work with high arc currents. Since about half of the heat of high-intensity arc radiation is produced by its infrared content (and the other half by visible light), imbibition color prints absorb only about 55% as much heat from the arc beam as do black-and-white prints of comparable visual density, and multilayer color prints about 70%. The emulsion of color films, accordingly, does not get as hot during projection as black-and-white emulsion, and color prints are thus comparatively free from such effects of high-amperage projection as frame embossing, film flutter, in-and-out of focus effects, blistering of the emulsion, etc.

To be specific, a radiant flux of 0.40 watt per square millimeter of exposed film area is regarded as the maximum that photographically dense black-and-white film can accept. (Blistering of the emulsion usually occurs at a flux of 0.45 watt/mm²*, depending upon the resistance to heat of the gelatin, a factor that varies somewhat among different makes of film.) Now, 0.40 watt/mm² corresponds to an arc current of about 75 amperes in "simplified" HI mirror arcs and 80 amps. in rotating-positive mirror arcs, no heat filters or air cooling being used.

Imbibition color prints, on the other hand, can safely be projected up to and including 0.70 watt/mm², nearly the maximum available with high-powered rotating-positive mirror lamps. This corresponds to a current of about 150 amps. without heat filters. Multilayer color films can be projected up to and including 0.55 watt/mm², corresponding to a HI mirror-arc current of approximately 120 amps. without heat filters.

These radiant densities are definitely the maximum for the different types of film when HI mirror arcs are used without heat filters. If we wish to avoid all possibility of focus-ruining film flutter, we should not exceed 0.35 watt/mm² (65 amps. in HI mirror arcs) for black-and-white film, 0.60 watt/mm² (130 amps. in rotating-positive mirror arcs) for Technicolor film, or 0.50 watt/mm² (100 amps. in rotating-positive mirror arcs) for Eastman Color film. Amperages may be substantially increased when effective heat filters are used.

There is no doubt, therefore, that color films of all kinds are less affected by radiant energy, and hence easier to project satisfactorily in drive-ins and other large theatres, than black-and-white films.

The focusing characteristics of color films are determined in part by the "resolving power" of the overall photographic and printing processes and in part by the behavior of the film when influenced by the heat of the projection lamp. We have already seen that color films absorb less heat than black-and-white. The quantity of heat absorbed by the dye images is nevertheless sufficiently great to affect focus.

Fuzziness in Prints

The inherent definition of color-film images, an interesting factor when comparing the quality of the different types of color film, is admittedly beyond the control of the projectionist. It is painfully obvious to every projectionist who receives a blurry color print that "the picture on the screen can't be clearer than the picture on the film."

Early types of color film, notably the double-coated printing stock chemically toned to a red image on one side of the film and a greenish blue image on the other, resulted in notoriously fuzzy screen images. Even the old-style imbibition prints were often intolerably blurry. But even though this process has attained a high degree of perfection, the very best imbibition prints fall short of the crisp clarity that characterizes black-and-white. The chief fault of imbibition prints seems to be the tendency of the magenta dye to "bleed," or spread in the gelatin coating of the print stock. Because the magenta image represents the visually critical green record, the clarity of any color film is determined largely by the sharpness of this image.

The imbibition process nevertheless supplied color to the theatre screen in commendable fashion until the inception of widescreen projection, so exacting definition-wise. Imbibition prints give good results on conventional 3:4-proportioned screens in spite of several faults affecting pictorial quality, but they tend to be fuzzy under the terrific image magnification required by large, wide screens.

Multilayer Color Film

Multilayer film came to the rescue of a color-conscious industry. Used on a limited scale in Europe for about 15 years previous to the commercial introduction of CinemaScope, this type of material, so similar to ordinary black-and-white stock in regard to photography, printing, and processing, has the advantage of the high resolving power of monochrome and a considerably wider photographic latitude than imbibition-printed color films. Its chief disadvantage was its high cost.

A few American producing companies employed multilayer color film for release prints on a limited basis several years before screens were stretched to extended aspect ratios. Results were gratifying in spite of inexpert scene-to-scene color balance. Audiences were pleased with full-range brilliant color extending from the brightest highlights down into the deepest shadows; and for the first time in the history of the movies, projectionists had a color print which could be focused as sharply as black-and-white.

Imbibition prints have managed to survive on account of their lower cost, but multilayer release-print stock is

*watt/mm2 is abbreviation for watts per square millimeter.

today the preferred medium for color.

The ability of color prints to withstand arc amperages that would literally scorch black-and-white prints is due to the same heat-transmitting factor that influences the focus characteristics of these films even when projected at rather low currents. Every projectionist knows that the optimum-focus position of the projection lens for color film is slightly different from the best lens position for black-and-white film. The focus needs to be "touched up" at every change from color to black-and-white, or *vice versa*, during the projection of a reel of trailers. And imbibition color prints require a different focus than the one that gives the sharpest pictures with multilayer color prints!

Buckling Under Heat

Whenever a reel of film is run through a "dark" projector, the film does not assume a perfectly flat position in the gate, but bulges out very slightly toward the lens. This is called "positive deformation" of film which is threaded up in the normal manner, that is, with the emulsion side facing the lamp. But when the lamp is lighted and the picture projected upon the screen, the film changes its position, the center of the frame at the aperture moving away from the lens and toward the lamp. A bulge of the film in the direction of the lamp is called "negative deformation," and is caused by the expansion of the emulsion relative to the celluloid-like film base.

Although the expansion of the emulsion depends largely upon the amount of heat it absorbs from the light, some of the "pin-cushioning" of the film is undoubtedly due to the "curliness" produced by rolling up the film tightly, or in small rolls in the case of trailers, especially when the film is fresh and not adequately dried. The curliness of trailer rolls is made evident by the abrupt changes in focus occurring when one trailer ends and another begins.

Deformation of the film caused by heat absorption is of greater significance than the curl factor in the projection of 1000-ft. and 2000-ft. reels. Because color films absorb less heat than silver-image films, they assume a flatter position over the aperture and are relatively free from rapid flutter and in-and-out of focus effects attributable to heat alone.

Unless lenses of uncommonly long focus are used, there is no such thing as one, and only one, "correct" focus position for the lens. Marks made on the lens barrel are useful for returning a lens to a position which is very nearly correct, but manipulation of the focusing knob *while a picture is being shown* is the only sure way of obtaining razor-sharp images on the screen.

Why Focus Changes

Now, because different films undergo different amounts of pincushioning at the aperture under the influence of heat — black-and-white films bulging the most, color films the least, — the focus *must* be sharpened from time to time during projection. Aside from the normal phenomenon of focus drift, which is due to the greater curliness of the film near the end of each reel, changes from black-and-white to color, or even from Technicolor to Eastman Color, alter the focus. One "projectionist" of our acquaintance allowed a color short to run all the way through out of focus because "the lens was set for a clear image on the feature film!"

The matter of color reproduction usually finds the projectionist faced

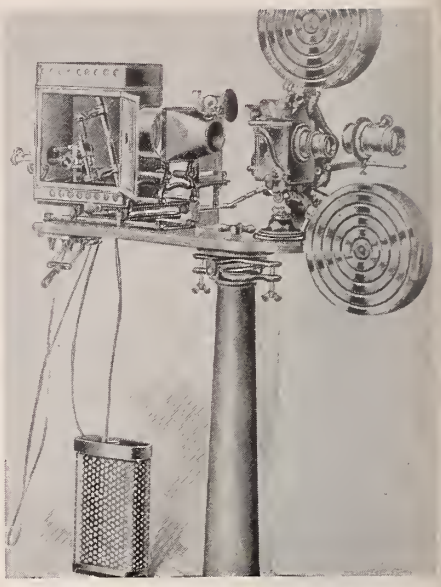
(Continued on page 25)

Ray Brian—His "Movieana" Archives

WITH our second issue for 1956, we bring a pleasant carry-over from 1955—another installment of historical data from Ray Brian's "Movieana" Archives." Mr. Brian, of Local 434, Peoria, Ill., has over the past years collected voluminous files of information concerning the motion picture projector dating as far back as the 1890's.

Having tracked down over 350 different items, including thousands of photographs of these, Brian is still anxious for more and will appreciate any leads his fellow projectionists may be able to furnish. Readers having such information may contact Brian through IP.

This month's installment begins with Le Petit, made in England in 1898, and ends with the Australian model, Mincrva. With the exception of the items marked with an asterisk, Brian has photographs of all the projectors listed. Does anyone have a photograph of the Motorpictoroscope, or Multophotoscope, or Mouvementoscope?



Matiagraph Model Na. 1 — 1908-1909

LE PETIT—made in England, 1898.*
LE ROY—Jean A. Le Roy, 1900.
LIFEOGRAPH—made in New Yark City.*
LUBIN—Sigmund Lubin, 1896 to 1917.
LUMEX—Lumex Mfg. Ca., New York City.*
LUMINOGRAPH—made before 1900.*
MAGNISCOPE—Edwin Hill Amet, Waukeegan, Ill., 1896.
MAGNUS—English versian af the German Bauer, 1939.
MARK II—made in England by S.U.P.A., 1953.
MARVELOUS—Jean A. Le Ray, 1912.*
MASTER—farmerly Standard, then later the Superior.
MASCHINEENBAU—built by Maltheser, 1913.
MATAGRAPH—Levi, Janes & Ca., Ltd., 1897.*
MECHAU—Dr. Mechau, Germany.
MELIES—made in France, 55-mm; later, 35-mm.
MESSTER—made in Germany, 1896.
MIDAS—Camera Projectar Ca., New Yark City.*
MICAGRAPH—Mike Berkawitz, New Yark City, 1905.*
MICRON—made in Italy by Micrateknika, 1948.
MIP—made in France, 1924.
MIRROGRAPH—made in U.S.A., 1912, right angle projectar.*
MIROGRAPHE—made in France, 1900, 21-mm.
MONARCH—made in Chicaga, abaut 1915 by Grant Mfg. Ca.
MOTIOGRAPH—first made by Alva Roebuck, 1908.
MOTORGRAPH—W. Watson & Sans, Londan, 1897.
MOTORPICTOROSCOPE—built by Hughes, 1900.*
MOVETTE—32-mm.
MOVENDOSCOPE—made by Woods in England.*
MOUVEMENTOSCOPE—made abaut 1900.*
MOY—made in England, 1914.
MULTIGRAPH—*
MULTOPHOTOSCOPE—made by Chas. Kayser, 1902.*
MUTOGRAPH—made by C. P. Maskelyne, 1896.
MUTOGRAPH—made by Clement and Gilmer, 1900.*
MUTOSCOPE—made abaut 1896, American Mutoscape Ca.
MINERVA—made in Australia.

Cheaper Color Tv Receivers Planned

COLOR Tv equipment manufacturers are slowly inching their way toward producing lower-price receivers, but they still have a long road to travel. The color Tv receiving system used by RCA and the experimental Lawrence color tube developed by Chromatic Laboratories were described in IP for September, 1953, and in the January and February 1954 issues. Now another color Tv picture tube is in the process of development at General Electric that combines many of the features of the two tubes previously described. If successful, this new tube is expected to reduce the cost of color Tv sets.

Structurally, the GE tube consists of three electrostatic guns lying in a plane in the neck of the tube, a grille consisting of a parallel array of wires fastened to the envelope itself and a front envelope surface on which the phosphor stripes are printed. Basically, it is a 3-gun type tube which uses direction selection at the front end to cause each of the three colorbeams to strike the power array of phosphors with which it is associated. The direction selection mechanism is of the masking type, described as "electron optical" masking rather than the usual shadow masking.

This new method of masking provides a much greater degree of brightness than is possible with the shadow mask. The increase is brought about through the use of a grille, or color selecting electrode, which has an extremely high transparency. About 90% of the emitted electrons strike the phosphor screen. This contrasts with approximately 12-14% in the conventional 3-gun color tube now on the market, it is claimed by GE engineers.

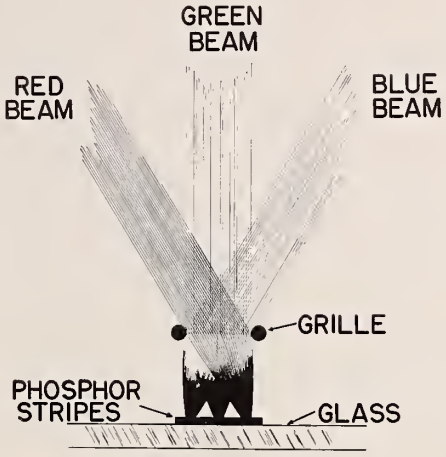
Where the shadow mask tubes have the guns arranged in triangular formation, the new GE tube has the guns arranged in a plane. Convergence must be applied dynamically at both the horizontal and vertical rates, but a complete separation of functions is possible with the single plane construction.

Performance

A considerable saving in deflection power is achieved through the use of "post acceleration." Each beam is attracted by only 6.5-kv, the voltage on the grille, instead of the conventional 27-kv of the shadow mask tube.

The most decided advantage of the new tube is in the high level of brightness which can be obtained. In tests conducted alongside the shadow mask models, under varying light conditions, the GE tube showed appreciable superiority, it is asserted.

Deficiencies are equally apparent in the GE tube. Because of the post acceleration principles involved, and because, for simplicity, only one grille is used, secondary electrons hit the screen in a random manner and cause the excitation of a white background. The result is a loss of picture contrast especially noticeable in a darkened room.



A grill of parallel wires behind the face plate of the proposed G-E color Tv tube positions electron beams representing the three primary colors on the face of the tube. This grille permits much more energy to reach the face of the tube than with methods now being used. The above drawing represents a tiny area on the tube face. Two wires of the grille are shown deflecting electron beams so that they will strike the proper band of color phosphor.

At a recent showing for the press, a moire or watery effect on the glass was very much in evidence. In addition, there was extensive pin-cushioning. GE engineers emphasized, however, that all these defects were minor.

Operation

What happens inside the tube is explained briefly as follows. When the electron beam enters the grille region, two things happen. First, the central ray of the particular beam (there are three: red, green and blue) no longer travels in a straight line, but assumes a parabolic path, influenced by the electrostatic field between the screen and the grille. Secondly, each pair of grille wires forms an electron optical cylindrical lens, which reduces the size of the beam in the horizontal dimension from its initial diameter of about 35 mils down to about 5 mils.

Since the beam size is a good deal smaller than the phosphor stripe width, there is little danger of the beam striking an adjacent stripe and thereby affecting color purity. This feature also permits a wide range of tolerances in the manufacturing process.

The new tube is not as yet in full scale production. Engineers at GE are still experimenting with it in the company's research and development department. When and if all the potentialities of the new tube are realized, it will be a major step toward upholding a prediction made by the Television-Electronics Fund. The prediction: 51,000,000 color Tv sets in the U.S. by 1965.

Little-Known Facts About VistaVision

THAT a large-size motion picture negative is needed to increase the sharpness of 35-mm release prints intended for wide-screen projection is now generally agreed. Not widely known are the factors that go into deciding on just how large this negative should be. At a round table discussion held recently in Hollywood under the sponsorship of the Motion Picture Industry Council, Loren Ryder, technical chief at Paramount Pictures, described how Paramount settled on the particular dimensions of its VistaVision negative which is later printed down in the laboratory.

Excerpts from Mr. Ryder's talk follow:

> Most of our original engineering work was done with pencil, paper and a slide rule, working with known factors of film and lenses. Early in our work, it became obvious that the limiting factor in photography was the negative, and that the positive release film was capable of presenting a better picture than was being photographed and printed. The answer was a large negative image and a reduction of this image to the smaller image of the release print.
>
> After recognizing the need for a larger negative image, the question was—How large? What is the optimum negative size for the best motion picture quality? There are three major factors:
>
> 1. As the negative image is made larger and larger, the picture quality improves in the plane of lens focus..
> 2. As the negative image is made larger and larger, graininess is reduced due to photographic reduction.
> 3. But the larger the negative image, the shorter the depth of field (sometimes called depth of focus). In other words, if the negative is too large background objects will be out of focus.
>
> Two pluses and one minus. With a little analysis and simple arithmetic we arrive at the optimum ratio of negative size to print size. The

(Continued on page 23)

In The

SPOTLIGHT

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

AT LONG last, recognition of the importance of the skilled projectionist in the proper exhibition of motion pictures to the paying public, was made evident in the recently announced SMPTE plans for technical training of industry craftsmen. Too long has the industry neglected the importance of skilled craftsmanship. We are of the opinion that IP's long and vociferous clamorings for projectionist recognition are about to bear fruit. We urge the readers of these columns to refer to the article "SMPTE Training Program for Projection Craft," appearing elsewhere in this issue for further details of the Society's tentative educational program for projectionists throughout the country.

• Representatives from a number of Southern Ohio and Indiana IA Locals met at Dayton, Ohio on January 13 for discussions on ways and means of solving mutual problems. One of the important topics debated was the handling of up-coming contract negotiations in the various territories. Also discussed was the subject of organizational drives encompassing all types of theatres — four-wall and drive-ins. Cooperation between all the Locals was definitely agreed upon and plans were formulated for a pooling of talents and resources for the best end results of all concerned.

Present at the meeting were Jack Gibbins (business representative), C. Hathorn, W. Rousch, Dayton Local 248; William Lynn (business representative), Floyd Shelton, Sr. (vice-president), Cincinnati Local 327; F. L. Francis (projectionists' business representative), Earl S. Roebuck (stage employe's business representative), Local 282, Middletown, Ohio; Peter Bisdorf (projectionists' business representative), Neil Johnson (stage employe's business representative), Local 136, Hamilton, Ohio; and W. J. Kyle (business representative), Local 236, Richmond, Ind.

IATSE 43rd Convention

The IATSE will hold its 43rd biennial convention in Kansas City, Mo., the week beginning Monday, August 20, 1956. Convention headquarters will be located at the Hotel Muehlebach and the Municipal Auditorium.

• We were sorry to learn of the recent mishap that befell Bill Georgas of the famous brother-team of champion skiers. While practicing an especially high jump, he broke one of his legs in six places, eliminating him from any further skiing activities for this season, at least. The Georgas brothers, Bill and Jim, are members of Toronto Local 173, and are famed throughout Canada for their skill and daring on the ski slopes. For years they have consistently walked off with most honors at many of the important meets and have become almost legendary figures in skiing circles. However, Jim Georgas upheld the family tradition by winning many of the contests in a recent important ski meet.

• The long drawn out negotiations between Local 199 and Detroit exhibitors were finally concluded with the signing of a new four-year contract expiring January 2, 1960. Thus was brought to an end the bitter and seemingly endless discussions between these two factions that at times appeared to reach the breaking-off point. It was a case of give and take for both sides.

Although the old contract expired July 31 last, no retroactive provisions were contained in the new pact. Included in the benefits gained by the Local are a six-day work week to replace the present seven-day week at the existing weekly pay scale; time-and-half for overtime, and an increase of $6 per holiday matinee (on the six established holidays) in night theatres. The Local's demand for a pension plan for its members, which proved the chief obstacle in reaching an agreement, will be given further serious thought by both sides. A joint committee will be appointed to make a study of the various pension plans and to report its recommendations at a later date.

• In a recent election held by the Pennsylvania Labor Relations Board, projectionists working in drive-in theatres in the Pittsburgh area unanimously chose Pittsburgh Local 171 as their bargaining agent in labor negotiations . . . The members of Local 171 accepted a 7½% increase in wages offered by the local chain theatre group.

WESTCHESTER CO. LOCAL 650 INSTALLS ELECTED OFFICIALS



Steve D'Inzillo (center), business representative for New York Local 306, presided at the recent installation of Local 650, Westchester County, N. Y. officers. Left to right: Michael J. Nugent, recording-corresponding secretary; Joseph A. Schappach, financial secretary-treasurer; Donato DePalo, vice-president; Anthony Dente, business representative; D'Inzillo, Max Kessler, Isadore Schwartz of N. Y. Local 306; Patsy Colarusso, 650 president; Francis X. Blatzheim, trustee. Albert E. Bell, trustee, is not shown in this picture.

This increase is to be used as the nucleus of a welfare fund for the membership. Plans for this fund are now in the formulative stage and details will be published in these columns when they have been completed.

• Howard Jackson of Local 343, Omaha, Nebr., who was recently re-elected business representative, has served his Local long and well. Elected business representative back in 1925, he held that office continuously until 1933. In 1940 he was again elected to that post and was re-elected each successive year, thus making a total of 24 years that he has served as business representative for Local 343.

• The annual banquet and dance of the 25-30 Club, association of veteran projectionists, held on January 8 at the Hotel Empire in New York City, was one of the biggest and best ever sponsored by



Allen G. Smith, honorary member of the 25-30 Club, and chairman of the Journal Committee.

the organization. The heavy attendance included officials from New York and out-of-town IA Locals, as well as representatives of projection equipment companies.

One of the high points of the evening was the announcement of a resolution awarding honorary parchment scrolls of appreciation to two members of the Club now in retirement. Charles Muller, well-known chief projectionist at New York's Radio City Music Hall until illness recently forced his retirement, was the recipient of one of the scrolls. The other was awarded to P. A. (*Better Projection Pays*) McGuire, longtime traveling representative for the International Projector Corporation. The scrolls were later presented personally to the two men at their homes by Allen G. Smith, New York City branch manager for National Theatre Supply and an honorary member of the 25-30 Club.

A feature of the affair was the presentation of an oil portrait of himself to Jacob Winick, retiring Club president. After thanking the group for the painting, Winick made a brief speech eulogizing McGuire and Muller. Referring to P. A., he remarked: "For years and years Mac traveled the length and width of the United States preaching the doctrine of good projection. Sure, Mac represented IPC, but he always avoided commercializing his task." Of Muller he said: "In addition to an unequalled technical contribution to his craft, Charlie's unselfish attitude toward his fellow men and brother workers has deeply endeared him to all."

Among those attending the party were Paul Reis, A. B. West, and Carl Lovgren, of National Carbon Co.; Ed Lachman, George Walter, Lorraine Carbons; Francis Keilhack, Drive-In Theatre Mfg. Co. (DIT-MCO); Vaughn Chambers, DuPont; Roy Fisher, Fisher Mfg. (Ethyloid Cement); and Charles Wheeler, secretary-treasurer of the New York State Association of Projectionists.

Representing New York City Local 306 were Steve D'Inzillo, business representative; Ernie Lang, secretary; Al Kunze, vice-president; Nat Doragoff, referee, New York State Workmen's Compensation Board. Out-of-town IA Locals were represented by Leon Burton, president of Rochester Local 253; John Cantoli and Al DiTitta, treasurer and vice-president, respectively, of Local 384, Hudson Co., N. J.

• Very proud of his offspring was Harry Mackler, former president of New York City Local 306 and of the 25-30 Club, when his son, Dr. Saul Mackler, performed an emergency chest operation on the TV program "Medical Horizons." This operation took place at Cook's Hospital in Chicago on Monday, January 16, last and was broadcast over a nation-wide hook-up. Dr. Mackler is one of the foremost chest surgeons in the country and is a member of the University of Chicago faculty.

• *IP Visitors from Out-of-Town*: Leon Burton, president of Local 253, Rochester, N. Y., and Roy Fisher, Fisher Mfg. Co., in New York to attend the 25-30 Club party, dropped by to exchange a few pleasantries with the staff of IP. W. J. Courtney, secretary of Local 349, Lima, Ohio, and Mrs. Courtney, on a vacation trip, called and we cut up a few touches.

• A note from Calvert Silverblatt, secretary of Local 181, Baltimore, Md., informs us that the Local participated in a Christmas show for the children of the striking Westinghouse workers. Members Charles Gerber and Irving Griebler ran the show.

Increased Minimum Wage Will Benefiit Movies

Under the new minimum wage-hour law, scheduled to go into effect March 1, 1956, some 2,100,000 workers in the U. S. will receive pay boosts guaranteeing them $1.00 an hour. The present minimum wage, set in 1950, is 75 cents an hour. It is estimated that the new raise will add a half-billion dollars to national payroll figures, and that the average hourly increase for those now earning between 75 cents and $1.00 per hour, will amount to 13 cents.

As the new hike is aimed at aiding the lowest income bracket, it is more than likely that the bulk of increased earnings will go toward the daily essentials—food, clothing, housing, medicine. However, a portion may be expected to go toward entertainment, thereby increasing attendance in theatres throughout the nation.

It will be interesting to see how the workers not affected by the forthcoming raise react to it. A definite pattern has established itself in this country over the years—when the pay of workers in a lower bracket is raised, proportionate raises usually follow for workers in higher brackets. This general spiralling may occur in 1956, as it did in 1950.

25-30 CLUB (NYC) HOLDS ANNUAL REUNION CELEBRATION



Shown here are past and present officials of the 25-30 Club attending the Club's recent annual party. Reading left to right: Al Kaye, Edward Dougherty, Morris J. Rotker, past presidents; Julius Wetzler, William "Bill" Anderson, trustees; Nat Strauss, sargeant-at-arms; Nathaniel Doragoff, vice-president; Harry Mackler, past president; Anthony Boscorelli, president; Jacob S. Winick, Abraham Kessler, past presidents; Morris I. Klapholz, recording-secretary; Sam Kirschenbaum, Joseph Perlman, trustees, and Benjamin Stern, financial-secretary and treasurer.

LETTERS TO THE EDITOR

A Great Picture, but too Dim

To the Editor of IP:

"Marty" may have received many awards but it will never win one for lighting. In my opinion, "Marty" was the poorest film so far as lighting goes that has been seen around New York since the days of the nickelodeon.

True, it was a great film in all other respects; nobody will take that away from it. I have seen this picture in three different theatres. The first time I thought the poor lighting on the screen was due to inadequate projection equipment, but I ruled this out when the second feature came out bright and clear. The fault was in the print itself.

The producers are said to have brought "Marty" in for about $650,000. I believe it has already grossed close to $2,000,000. Surely some more money could have been put into proper lighting. It's great to see a picture of such feeling and quality, but why must the price you pay include eyestrain. I would be interested in hearing what some of the projectionists who screened "Marty" have to say about this matter.

TONY FLANAGAN

Bronx, N. Y.

COMMENT: Many complaints from projectionists, managers, and the public were forwarded to M. D. O'Brien, director of projection and sound for Loew's, following the extensive showings of "Marty" in the circuit's theatres. These complaints were in the same vein as those made by Mr. Flanagan, and Mr. O'Brien was of the opinion that they were completely justified.

What may have led the producers of "Marty" into this error is the lack of universal motion picture production standards since the introduction of new-process projection a few years ago. If "Marty" had been shown in a well-equipped theatre, say four years ago, few complaints probably would have been made. It would then have been possible to project a sharper and brighter image of its dark, high-density print on the smaller screens used at that time. A dim, grainy screen image is likely to result when a standard black-and-white 35-mm print is highly magnified in masked-aperture wide-screen projection. When the print is an unusually dark one, such as that of "Marty," the results can be dismal.

Dim, low-key lighting was used intentionally in the production of "Marty" to achieve an artistic effect—to duplicate the night-time atmosphere of a drab New York neighborhood. The picture, itself, won an international prize and was cheered by critics throughout the world. It is unfortunate that Hollywood, which first demanded the large screen, forgot on this occasion that the "new look" requires changes in production in addition to new methods of projection in the theatre. However, the very small budget on which this fine film was made may have severely limited the producers.

Kindness Is Appreciated

To the Editor of IP:

The article "Rear-Projection CinemaScope Aboard Ocean Liners" in the December issue of IP was of particular interest to me.

My vacation last October was spent aboard the *S.S. Independence* on its Mediterranean cruise where I met Brother Al Sprung and Brother Corn, members of New York Local 306, the projectionists on the ship. They made my trip very interesting by showing me the installations of the equipment as described in the article mentioned. It is quite an achievement and satisfactory to the extent that, after forty years of almost continuous projection of moving pictures, I found myself actually watching the entire show. It had been some time since I stayed with a picture long enough to see "who got the girl."

Perhaps this letter will express my appreciation again to Brothers Sprung and Corn for their kind consideration.

LUTHER W. THOMPSON

Sec.-Treas., Local 171

Pittsburgh, Penna.

Protecting Tube Rectifiers

To the Editor of IP:

I have read your article, "Rectifiers for Projection Arcs," which appeared in the November issue of I. P., with a great deal of interest. I refer to paragraph 3, column 2 of page 33 which reads as follows: "There is little reason to fear that breaking the DC circuit by means of the arc lamp table switch will develop a surge of current, due to the transformer reactance, that will cause flashover and damage to tungar rectifying tubes."

I do not feel that manufacturers of tube type rectifiers, particularly those units having higher output voltages, will agree. Most manufacturers definitely advocate switching the input circuit, never the output circuit, with a two to three second waiting period for the tube filament to come up to temperature, before applying the load.

When the DC output is interrupted by switching, which simulates a rapid break with the primary circuit energized, high voltage transients in the order of 1200 to 1500 volts have been measured, apparently originating from the collapsing flux of the shunt field winding in the arc control motor. These transients are directly across the secondary of the transformer, and greatly exceed the inverse peak rating of any argon filled tube. Only a half cycle duration is required to make both tubes conductive, once the inverse peak rating of the tube has been exceeded, resulting, virtually, in a fully short circuited secondary, the resistance of the valves and the reactance of the transformer being the only current limiting factors.

When these phenomena occur they may blow primary fuses, but if the fuses are uprated an arc stream will establish itself between the filament and plate of the tube, blowing outwardly to the glass envelope, directed perhaps by the magnetic field surrounding the tube.

The intensity of the arc stream is sufficient to melt the glass envelope, and since the gas contained in the envelope is below atmospheric pressure, a hole will actually be "sucked" into the envelope. If this does not occur the filament will be snapped off at the leg due to the high concentration of energy at this point.

Various means have been employed over the years to arrest these transients, such as the use of thyrite resistors, wire wound resistors, and so forth, but the guaranteed and inexpensive method, so far as tube type rectifiers are concerned, is to simply switch the primary circuit. If no energy is available in the secondary circuit at the instant the transient occurs you need have no concern for the value of the transient.

Manufacturers, I'm sure, have spent better than twenty years educating the user not to break the DC output of the tube type rectifier, and we are simply passing this information along for whatever value it may have to the craft.

RICHARD F. KNEISLEY

The Kneisley Electric Co.

Toledo, Ohio

COMMENT: At the foot of column 3 on page 32 of the November issue of IP appears essentially the same advice that Mr. Kneisley extends to the craft, namely, "tube rectifiers having tungar diodes may be left on continuously or shut down when not in use *according to the manufacturer's recommendations.*" However, some makes of tube rectifier, and in particular single-phase units, are designed for control on the DC, or output, side. Arc power is turned on and shut off by means of a knife switch in the DC circuit without danger of damage either to the tubes or to the rectifier.

In addition, it is worth mentioning that the precaution of turning the rectifier on and off by means of a switch in the AC line does not always completely protect the unit against the consequences of flashover. There is the possibility of the arc snapping out, due to faulty operation of the feed mech-

anism, improper adjustment of the control rheostat, a wrong trim of carbons, or even drafts in the lamphouse. It might be argued that the electrical break is not so sudden when an arc snaps out as when a knife switch is opened, which is true. Under certain conditions, however, the break may be sufficiently rapid to develop reactance surges close to the values mentioned by Mr. Kneisley in his letter.

ABOUT VISTAVISION

(Continued from page 19)

optimum ratio of reduction is 1.75/1. Our VistaVision ratio is 1.72/1. Subsequent to our work the reduction factor of 1.75/1 has been confirmed by the Eastman Kodak Company in a paper prepared by G. C. Higgins, R. L. Lamberts and R. A. Purdy and presented at the Chicago Convention of the SMPTE in April, 1955. With reference to linear dimensions of the image size the paper reads:

"The print made at a reduction of 1.5/1 was judged by every observer to have better definition than the contact print. The prints made at reductions of 2/1 and 3/1 were not judged to be any better from the standpoint of definition than the print made at a reduction of 1.5/1."

After we completed our arithmetic, we took a look at the VistaVision picture. It had obeyed all of the requirements. A 30-foot picture can be expanded to 45 feet or maybe 50 feet and still meet the requirements. But as we, or anyone else, expand a vertically projected 35-mm picture much beyond this width, we encounter a new limitation—*image amplification in projection*. Here is where the VistaVision double-frame projection system steps in and, on the same optical quality basis, the picture can be expanded from 45 feet to 78 feet. If anyone wants a screen larger than 78 feet, he probably should use a negative image size larger than the VistaVision negative image and he must accept a loss in depth of field.

Are You Moving?

Are you planning to change your address? If so, please notify our circulation department one month in advance. The Post Office does not forward magazines mailed to a wrong address. To avoid confusion and delay, please cooperate by sending us both your *new* and your *old* address.



1st Choice
for the PRIME LENS
SUPER SNAPLITE

8 out of 10 Exhibitors today choose a Kollmorgen Super Snaplite for their prime lens. Perhaps this is because for more than thirty years Snaplites have been the standard by which all other lenses have been judged.

For speed, for contrast, for definition and for terrific brilliance on the screen, your 1st Choice is a Super Snaplite.

Write for Bulletin 222.

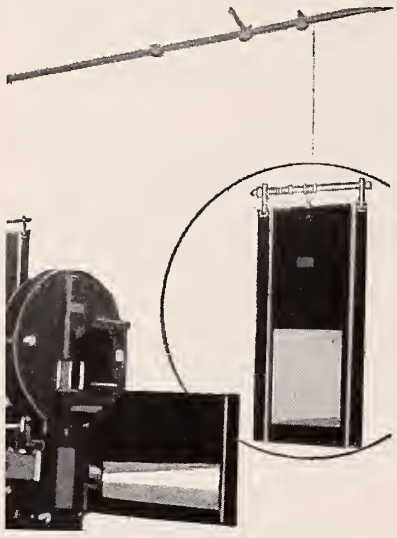
KOLLMORGEN Optical CORPORATION
Plant: Northampton, Massachusetts
New York Office: 30 Church Street, New York 7, N. Y.

NEW PRODUCTS

Fire Door Shutter Balancer

A new torsion counter balancer, designed for smooth, quiet closing of projection room fire-shutters, is being produced by Best Devices Co., of Cleveland, Ohio.

The balancer is designed to fit all present makes and sizes of door shutters.



New counter balancer from Best Devices installed in projection room.

It consists of a shaft that rotates on bearings formed by two end mounting brackets, a torsion spring, and an arbor that winds or unwinds a cable that fastens to the shutter door.

By mounting the shaft parallel on the top of any fire shutter frame, the cable readily winds or unwinds on the arbor as the shutter is raised or lowered. As the shutter lowers, the cable unwinds turning the arbor as well as the shaft against the resistance of a torsion spring, thereby effecting a gentle closing.

Panatar 16-mm Anamorphic Lens; Big, Portable Radiant Screen

Panavision, Inc., makers of the Panatar lenses, have brought out a new 16-mm anamorphic lens adaptable to both photography and projection. At the same time, Radiant Mfg. Corp., Chicago, distributor of the Panatar line, announced a related product of its own — a portable wide-screen.

The 16-mm combination lens is priced at $169 and goes under the trade name, "Superama 16." In addition to theatrical motion picture use, the new lens is said to have unlimited possibilites in the television and industrial film fields, permitting quick adaptation to any standard 16-mm camera or projector. Also being developed by Panavision are 8-mm and 35-mm anamorphic lenses capable of the same interchangeable taking and projecting capacity.

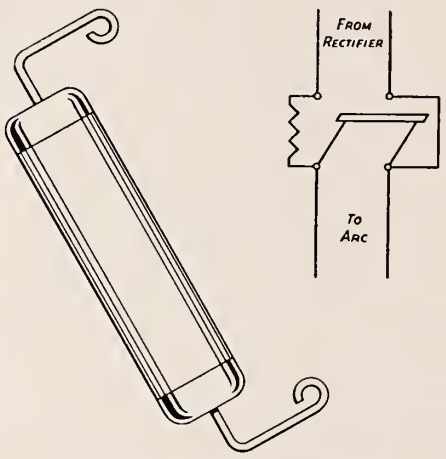
The new line of Radiant screens, built for ratios of 2:1 and 2½:1, are available in both the portable and light semi-portable models. It was reported that increased interest during 1955 in 8-mm and 16-mm movies and 35-mm slides was reflected in new record demands for screens.

Arc Striking Current Reduced By New Kneisley Device

The Kneisley Electric Co., Toledo, Ohio, has announced the development and production of an "arc striking current minimizer" to be used in connection with its line of high current selenium rectifiers. It is claimed that the use of this unit will add greatly to the life of a selenium stack.

All heavy duty selenium rectifiers provide heavy inrush currents at the moment of striking the arc, ranging from 250 to 300% of full load current. This places a severe load on the selenium stack, in addition to damaging the positive crater of the arc. With the minimizer, the arc is established at approximately 85 amperes, and runs at 120 amperes on a 135-ampere rectifier, instead of striking at 300 to 400 amperes as is usually the case.

The arc striking current minimizer connects across one blade of the lamphouse table switch, as shown in the



Arclamp striking current minimizer.

schematic diagram. The switch is opened prior to striking the arc, so that the minimizer is in series with the load. Immediately after striking the arc, and separating the carbons ⅛-inch, the switch is closed, shunting the minimizer and supplying full load current to the arc.

The minimizer will be furnished as standard equipment on all heavy duty units manufactured by Kneisley. For application to presently operating selenium rectifiers, it is also available at supply dealers.

PERSONAL NOTES

ETHAN M. (ED) STIFLE has been appointed SMPTE sections vice president for 1956-57. Previously sections coordinator, he will be the first man to



Ethan M. Stifle

hold the new office, recently created by amendment to the Society's constitution. Mr. Stifle has been active in SMPTE affairs since 1945. He is the East Coast division manager of the motion picture film department of Eastman Kodak.

* * *

J. W. BELCHER, has been named manager of a newly created application engineering department at General Precision Laboratory, Pleasantville, N. Y. The new department will be concerned with the invention and development of new and advanced uses of TV equipment. Also at GPL, N. M. MARSHALL has been designated to direct sales of TV equipment to industrial and institutional markets. Both these assignments are part of a program to increase GPL's participation in the growing industrial and institutional Tv fields.

* * *

GORDON P. MANN has been promoted to manager of technical and laboratory services at Ansco, photographic manufacturing division of General Aniline & Film Corp. Mr. Mann joined Ansco in 1937 and since then has played an important role in founding the present huge independent color film and color print processing industry. In his new capacity, he will be responsible for the operation of all of Ansco's color processing laboratories and will continue to work closely with the growing number of locally operated color processing labs in the U. S. and Canada.

* * *

ROBERT S. BALLANTYNE, founder of the Ballantyne Co., theatre equipment manufacturer, is relinquishing the president's post, a position he has held for 25 years, to become chairman of the board. The vacancy is scheduled to be

filled by ROBERT HOFF, vice-president and sales manager.

Mr. Ballantyne, now 66 years of age, has been associated with theatres since 1908, when he started in exhibition. Following many years in distribution and management, he founded the Ballantyne Co. in 1931.

"Bob" Hoff joined Ballantyne in 1945 as sales manager. A member of the SMPTE, Hoff has been active in the Theatre Equipment Supply Manufacturer's Association, serving as director in 1947-49, vice-president in 1949-51, and president in 1951-53. He is now an honorary board member of TESMA.

COLOR FILM REPRODUCTION

(Continued from page 16)

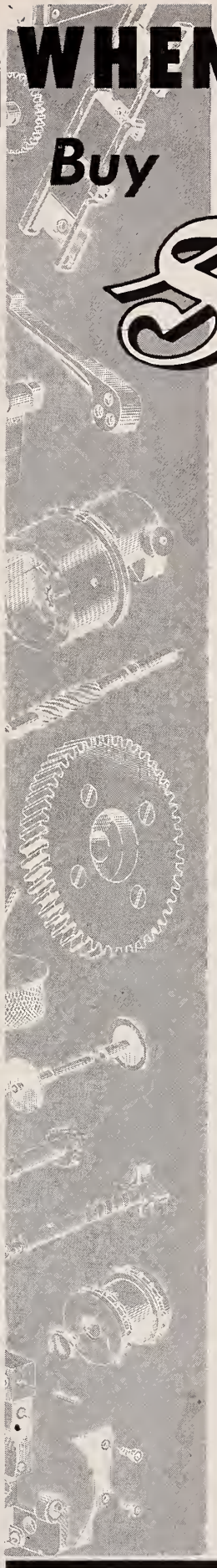
by hopeless odds: if the color is bad on the film, he cannot improve it any more than he can remedy bad focus on the film. However, the satisfactory reproduction of *good* color depends entirely upon his knowledge and skill.

Most of the color processes in use at the present time are capable of well-balanced color reproduction despite unavoidable spectral limitations of the printing dyes. The poor color we sometimes see on the theatre screen is often due to inexpert color adjustment by overworked laboratory technicians and to producers' queer ideas about color.

We are not alone in our distaste for bright blue shadows and chalk-white illumination of interiors supposedly lighted by candles, oil lamps, etc. We have seen red uniforms change abruptly from carmine to orange in scene-to-scene cuts, bright green horses in westerns, and rose-pink snow in films of mountain-climbing expeditions — all of them the mistakes of the fellows who are paid to balance the color during the separation and duplicate-negative stages of production.

Color Balance at Arc

The projectionist who knows his color theory realizes that the color print, itself, supplies no color to the screen. The projection lamp does that. The dye images of the print merely subtract from the "all-color" white light of the arc the *complementaries*, or opposite colors, of the colored objects delineated on the film. The colors that appear on the screen, therefore, are the colors of the arc radiation *minus* the colors subtracted (absorbed) by the dyes of the color film. If the arc lamp fails to supply a balanced "assortment" of colors, the colors re-



WHEN YOU BUY...

Buy Simplex

T.M. REG. U. S. PAT. OFF.

Your SIMPLEX Projector Mechanism represents a priceless investment. You bought it after long, careful study because you recognized it as the finest projector on the market.

Don't take chances with such an investment — *the very success of your theatre* depends upon its performance! When spare parts are necessary, insist on the best — insist on *SIMPLEX* parts!

From the smallest stud pin to the largest gear cover, every part is made with the same precision and skill as the mechanism itself. By using *only* SIMPLEX parts, you can be certain of maintaining the high quality of performance that has made SIMPLEX the world's foremost projector mechanism!

Genuine SIMPLEX parts are available only through

N.T.S.

Your Guarantee

of Consistent Quality and Outstanding Service

NATIONAL THEATRE SUPPLY • 29 BRANCHES COAST-TO-COAST

produced on the screen will be faulty *even if the print be perfect!* Nothing in the print can make up for colors missing from the projection light.

Suppose the lamp supplies light of an orange color. Light of this color contains red rays, a small amount of green rays, and no blueviolet rays at all. So no matter how good the color print may be, all blueviolet and deep blue objects in the picture will look black on the screen.

0 - 25 - 100	Orange light
× × ×	
100 - 0 - 0	Blueviolet on film
0 - 0 - 0	Black on screen

Bright blue objects will appear dark green on the screen, yellow objects will look orange, and only red objects will appear in a natural intensity of color.

0 - 25 - 100	Orange light
× × ×	
100 - 60 - 0	Bright blue on film
0 - 15 - 0	Dark green on screen
0 - 25 - 100	Orange light
× × ×	
0 - 100 - 100	Lemon yellow on film
0 - 25 - 100	Orange on screen
0 - 25 - 100	Orange light
× × ×	
0 - 0 - 100	Red on film
0 - 0 - 100	Red on screen

No projection illuminant is so deeply hued as the orange light we have used merely for the purpose of illustration; but incandescent (mazda) and low-intensity carbon arc light sources have many of the color-ruining characteristics of orange light because they are seriously deficient in blueviolet and green rays. The high-intensity arc (color temperature of from 5,000 to 6,000 degrees on the Absolute, or Kelvin, thermometer scale) is visibly *whiter* than the comparatively yellowish light of the low-intensity arc (color temperature about 4,000°K.) or the amber light of a mazda bulb (2,500°K. to 3,500°K.).

"The whiter, the better" — this is the rule when selecting light sources for the projection of color films. But even "white" is a relative term: the distinctly amber illumination of incandescent lighting *looks* white after our eyes have become accustomed to it. For projection purposes, however, there are reasons which require us to have a really white — a "daylight-white" — light source. We not only have to duplicate the color-temperature conditions of exterior scenes, but we also have to reproduce in full brilliance *all* of the colors on the film, the violets and blues as well as the oranges and reds.

"Warm" Light Sources

The LI arc, as we said, is yellowish in comparison with the HI arc. For black-and-white projection yellowish and amber light sources are very satisfactory because they are psychologically "warm" and very easy on the eyes. (Remember when films were tinted?) Blue-white screen illumination is psychologically "cold," and may look harsh and chalky. But for the successful projection of natural-color prints, this is the kind of light we must have. Prints are balanced chromatically for projection *via* the HI arc.

Because heated carbon radiates like a perfect "black body,*" the color temperature of the LI positive crater (4,000°K.) is the actual temperature of the vaporizing carbon. The HI arc, on the other hand, produces much of its light by a complex process of luminescence, and is never actually as hot as its color temperature would indicate. (In point of fact, the temperature of the HI arc is no greater than that of the LI arc.) And because the predominant wavelengths emitted by HI luminescence may be varied by changing the chemical composition of the carbon cores, different HI positives produce radiation of different color temperatures.

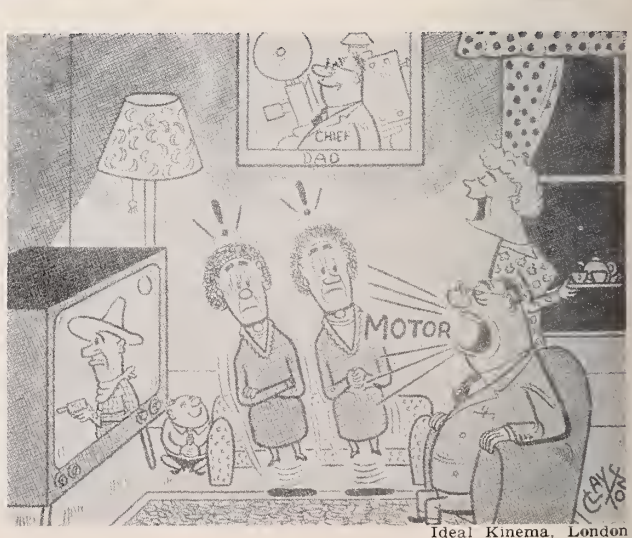
For 16-mm projection, HI carbons having the low color temperature of the mazda lamp have been developed. For 35-mm projection, whiter carbons are used. Some HI positives for theatre use have a color temperature as low as 5,000°K.; others as high as 6,000° K., the color temperature of midday sunlight. Some of the first HI positives had color temperatures as high as 10,000°K., the color temperature of average daylight, a definitely bluish white.

Differences in Carbons

Some grades of HI positive produce a pinkish or greenish white light, tints that cannot be assigned a color temperature. As its temperature is gradually increased, a "black body," such as carbon, first assumes a dull red glow and then brightens to scarlet, amber, amber-white, yellow-white, pale yellowish white, sunlight-white, daylight-white, and bluish white, the maximum being "equal-energy white" of infinite color temperature, a blue-white similar to that of north skylight. No greenish, pinkish, or lavender whites appear in the series.

Carbon manufacturers could serve the craft well by guarding against objectionable tints in the light furnished by their HI positives. Pinkish light results from a deficiency of green rays, greenish light from a deficiency of red and blueviolet rays, and laven-

*** The term "black body" refers to a standard used in the Kelvin scale for measuring color temperature. For instance, the slightly yellowish light emitted by a LI positive crater is 4,000 degrees Kelvin (4,000° K.) or exactly the same in color quality as the light emitted by the theoretical black body when heated to that degree. A more complete explanation of color temperature measurement can be found on page 10 of the June, 1955, issue of IP.**



"It's quite all right. He does that every now and again when a little white dot pops up in the corner of the screen."

Ideal Kinema, London

der light from a paucity of green and red rays. We suggest, also, that an assortment of color temperatures in each grade and size of HI carbon be supplied. It is not the color of the raw arc radiation, but the color of the light *reflected from the screen*, that concerns the projectionist. And in travelling from the crater of the positive carbon to the screen, the light undergoes a number of reflections and transmissions which change its color.

The various elements by which the light emitted from the positive crater is transmitted and reflected — mirror, condensers, heat filters, draft deflectors, projection lens, port glass, and the screen, itself, — tend to reduce the color temperature of the light by *yellowing* it. To obtain a "sunlight-white" color of light from the screen, therefore, HI trims of higher color temperature than 6,000°K. must be burned in the lamp. If the screen is definitely yellowish in tint — a color which it will rapidly acquire in theatres where smoking is permitted, — the arc illumination should be definitely bluish.

Checking Color on Screen

It is not easy to evaluate the color temperature, or degree of whiteness, of the light reflected from the screen. The use of trichromatic photometers is complicated and troublesome. We suggest direct comparison of the illuminated screen of a television set placed on the stage with the motion-picture screen illuminated by projected blank light. It should be determined beforehand, of course, that the Tv screen furnishes a light comparable in whiteness to direct sunlight reflected from a cloud or from snow at noon.

As far as the reproduction of natural-color films is concerned, too much has been made of the ability of the eye to adjust itself to different color temperatures of illumination. A sheet of white paper looks white when illuminated by yellowish lamplight in the evening, but it is still impossible to match green and blue fabrics by such "unbalanced" illumination. White clouds in a Technicolor film projected *via* a low-intensity arc will look white after the eyes of patrons have become accustomed to the yellowish light, but the violets, blues, and greens in the picture will be much less luminous than in the scene originally photographed. Natural color *demands* the use of "natural," snow-white picture illumination!

Curiously, black-and-white films suffer more than do color films when the light is discolored at the corners and sides of the screen. Color prints seem to mask such discolorations of screen light: monochrome prints allow the discolorations to be clearly seen. This does not mean that the projectionist can safely neglect adjustment of the mirror and carbons when color subjects are shown — to take chances with the lamp adjustments often leads to progressive deterioration of the light.

The psychological effect on projected color films of colored exit signs, clock dials, aisle lights, etc., is much disputed. A red-illuminated exit sign, for example, is presumed to induce an enhanced green-blue (cyan) visual sensitivity which may interfere with the proper perception of the colors in the projected pictures. Then, too, there is the matter of distracting theatre patrons with colored auditorium lighting. If such lighting is fairly saturated in hue, direct comparison may unconsciously be made with colored objects on the screen. When such illumination actually falls upon the

Announcing...

THE NEW **ISCO** PROJECTION LENS

THE FASTEST PROJECTION LENS IN THE WORLD FOR THEATERS AND DRIVE-INS

At last, an ultra-speed lens has been achieved without sacrificing quality...

THE NEW f/1.5 SUPER-KIPTAR S



There's an ISCO Lens for every projection need— Wide Screen and Cinemascope.

"IF IT'S AN ISCO IT HAS TO BE GOOD" ISCO

See your dealer today or write

ISCO OPTICAL WORKS

U.S.A. Sales Office • 705 Bronx River Road, Bronxville 8, New York

Clayton Ball-Bearing Even Tension Take-Ups

For all Projectors and Sound Equipments

ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS.
SILENT CHAIN DRIVE

THE CLAYTON REWINDER

FOR PERFECT REWINDING ON 2000-FOOT REELS.

CLAYTON PRODUCTS CO.

31-45 Tibbett Avenue New York 63, N. Y.

screen, a very serious problem arises.

Some years ago the Technicolor Corporation mentioned this matter in a bulletin to projectionists and house managers. In addition to some very sound advice anent careful operation of the arc-lamp and attention to focus during the showing of Technicolor pictures, the bulletin suggested that exit signs be illuminated with green bulbs instead of red, and that aisle lighting be blue in color.

The use of green instead of red in exit signs is a recommendation of considerable merit — green is less distracting visually than red. Being a cool color, green is also psychologically less exciting than a fiery, danger-suggesting hue. The same recommendation applies to illuminated clock faces, which should be green instead of white or amber. It is doubtful, however, that the color of these accessories influences in any way the effect of colors in the picture.

Blue Aisle Lights

The use of blue aisle lighting instead of the customary white or amber-yellow is questionable practice, as this lighting, required for safety purposes, seldom reaches the eyes of patrons who are looking at the picture on the screen. Moreover, the blues have extremely low visibility, and when admixed with a small amount of red (producing violet or purple), the natural chromatic aberration of the eye causes unclear vision. Nothing looks clear in purple light. Since the aisle lights are intended to guide the footsteps of perambulating patrons, white or yellow is preferred for maximum visibility at the lowest practicable levels of illumination. *Avoid blue aisle lighting!*

The use of *general* auditorium lighting during the showing of color films is frequently disastrous to good color rendition in the darker areas of the projected pictures. This is especially true when the lighting is furnished by bright bulbs in colored-glass wall fixtures or by neon tubes in a ceiling cove. A central chandelier-type fixture which is merely dimmed during the performance instead of being turned off altogether can be especially annoying. In a theatre recently visited by the writer such a chandelier was fitted with bulbs of a hideous magenta-pink color and left on during the show. The effect was nauseating.

General lighting necessarily falls upon the screen; and when the "spill light" is red, the black areas of the projected picture become terracotta brown, dark green areas become olive or drab, the blue-green areas, gray, and the deep blue areas, distinctly purple. The change in color takes place according to the laws of simple color addition, as, for example:

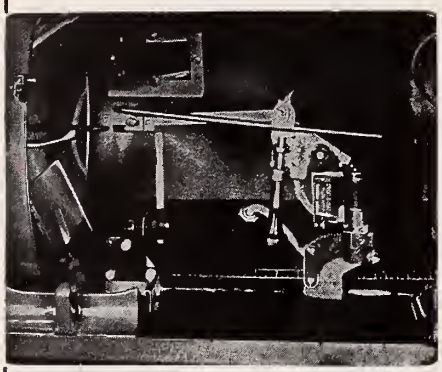
0 - 3 - 0	Dark green in picture
+ + +	
0 - 0 - 4	Deep red spill light
0 - 3 - 4	Khaki-brown resultant

The practice of color-flooding title footage, so effective for dressing up the show when black-and-white films are presented, should be avoided when the picture is in color. The titles of most color films are beautifully designed, and may undergo bizarre changes in hue when flooded by colored footlights, striplights, or spotlights. A dark green tree becomes orange when flooded with bright red light, and dark red lettering turns rosy purple when flooded with blue light — all examples of color addition.

Projecting Through Curtains

Projecting the titles of natural-color films on colored curtains produce hue changes by color subtraction. The effect is similar to that obtained when

The Most Expensive Carbons Are Those Which Aren't Burned



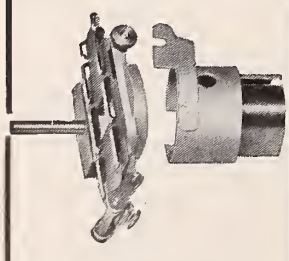
If you have Ashcraft "D" or "E", Brenkert-Enarc, Peerless Magnarc, or Strong Mogul projection lamps, a

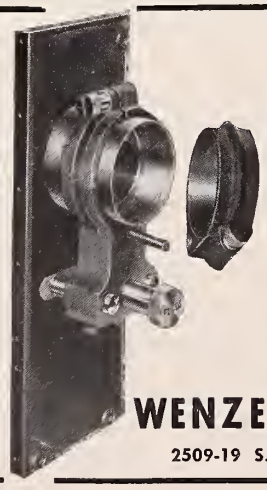
CRON-O-MATIC
Fully Automatic
CARBON SAVER

Pays an average return of 900% on your money. You invest only $42.50 and save $400.00 annually!

Uses positive carbon stubs of any length, without preparation. When entirely consumed, the new carbon goes into use without losing the light, or otherwise affecting lamp operation. Burns average lengths (3¼") down to ¾", saving 2½" or 22.2% of carbon costs. If your dealer can't supply you, order direct.

PAYNE PRODUCTS CO. (Cron-O-Matic Division)
2454 W. Stadium Blvd., Ann Arbor, Michigan
( ) Send literature an the Cran-O-Matic.
Ship Cron-O-Matic ( ) C.O.D. inc. postage. ( ) Remittance herewith.
NAME.....
THEATRE.....
STREET.....
CITY & STATE.....
EXPORT: Frazar & Hansen, Ltd., San Francisca, New York, Los Angeles





WENZEL NEW INTERIOR LIGHT SHIELD
PRO 55
to be used in conjunction with the PRO 47.

EW 78
The Improved Wenzel Heavy Duty Triple Tension Film Door Assembly.

Write for Illustrated Circular showing these and other Wenzel Improved and New Products.

WENZEL PROJECTOR CO.
2509-19 S. STATE ST., CHICAGO 16, ILL.

color filters, such as spotlight gelatins, are placed in the projection light. This writer has always disliked the common practice of projecting titles on curtains because the images so often look dim and distorted on such surfaces. Many patrons become mildly annoyed when the title curtain remains closed until the opening scene of the picture comes along. Few people care about the "credits" — who produced the picture, edited the script, etc., — but everyone appreciates a clear view of whatever is being projected.

Color *addition*, as when spill light falls upon the screen, affects the darker parts of the projected picture; color *subtraction* affects the lighter parts. The white areas of a title change to yellow when shown on a yellow title curtain; and because yellow absorbs all blueviolet, reflecting only the green and red components of the projected light, deep blue objects will look black or gray when projected upon such a curtain.

If the title curtain is a primary color — red, for instance, — a colored title will have the appearance of a black-and-white title on red-tinted film, no other colors being perceptible.

0 - 0 - 40 Dark red curtain
× × ×
0 - 80 - 100 Yellow objects in picture

0 - 0 - 40 Dark red resultant

The primary colors are blueviolet, green, and red; and a colored title will change to monochrome when projected upon any curtain of such hue.

Special advice anent the care, splicing, and storage of color film is superfluous, for all color prints in use at the present time contain very stable dye images and are handled in the same way as black-and-white prints. Scratches, cue defacements, and carelessly made splices are as ruinous to monochrome projection as they are to color presentations: *both* types of film should receive the *same* careful treatment from the projectionist.

It is only necessary to bear in mind that the visual advantages of full natural color are largely nullified by rough handling of the prints. Projectionists know this better than many exchange inspectors because it is the projectionist who has to show the film and look at evidences of print damage highly magnified on the screen.

[END]

New Closed-Circuit Tv Uses

A king-sized closed circuit network, employing a total of 59 General Precision Laboratory television projectors to link up over half a hundred cities throughout the nation, was a major factor in the successful "Salute to Eisenhower" fund-raising celebration held last month. Theatre Network Television, Inc., engineered the project.

An experiment now being conducted at New York University has closed circuit television transmitting a pair of English courses to several different classrooms on the campus. Penn State was the first university to employ closed circuit for classroom teaching and recently published a detailed report of its findings.

European SuperScope Labs

Foreign facilities will soon be available for the processing of SuperScope color prints. Under an agreement now being worked out, Technicolor will install the Tushinsky SuperScope equipment in its laboratories in London and Paris. At present, Technicolor handles all SuperScope printing in Hollywood.



ARE YOU A COUPON CLIPPER?

Most coupon clippers are far-seeing. They can recognize a good investment at less than 20 paces.
There are various types of coupons. The one below suggests a good investment, too. Smart showmen who clip this particular coupon are taking a short-cut to an investment that pays dividends in perfect sound, satisfied patrons, and vanishing service worries.
Mail it today and join 6,000 service-happy exhibitors.

SPECIALISTS IN MOTION PICTURE SOUND

ALTEC SERVICE CORPORATION

161 Sixth Avenue
New York 13, N. Y.

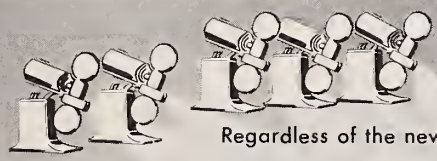


ALTEC SERVICE CORPORATION
161 Sixth Avenue • New York 13, N.Y.
Please have an ALTEC representative call, without obligation, to inform me about your service contract.
Also please mail copy of booklet—
THE ALTEC SERVICE STORY.

Theatre

City and State

Ask for



ONE? TWO? THREE?

Regardless of the new medium you select for your theatre, all "depth" pictures require near perfection from the projectors. Before converting see your dealer about using LaVezzi projector parts in an overhaul. The unusual precision and long life bring about efficiency, economy, and peace of mind.



LAVEZZI MACHINE WORKS
4635 W. LAKE ST., CHICAGO 44, ILL.

IA ELECTIONS

LOCAL 106, MARION, IND.

Milton Huffaker, *pres.;* Harrison Rainey, *vice-pres.;* Arlington Hankins, *sec.;* Glenn Weaver, *fin.-sec. and bus. rep.;* Gene Miller, *sgt.-at-arms.*

LOCAL 154, SEATTLE, WASH.

Fred Jiencke, *pres.;* Harold Simpson, *vice-pres.;* Frank McClellan, *rec.-sec.;* Ash Bridgham, *fin.-sec.;* Frank Myers, *treas.;* James McNabb, *bus. rep.;* Bill Freeman, *trustee;* Fred Hawkins (member at large), *exec. board.*

LOCAL 171, PITTSBURGH, PENNA.

Daniel V. Flask, Sr., *pres.;* Paul P. Mach, *vice-pres.;* Luther W. Thompson, *sec.-treas.;* James V. Sipe, *bus. rep.;* Angelo Diodati, *sgt.-at-arms;* Charles P. Lang, Deane D. Martin, Leroy McConnell, *exec. board;* James O. Caskey, Russell R. Kerr, William Reiser, *trustees;* J. A. Sipe, J. W. Shawkey, George Pavlich, Ralph J. Ferry, *del. Pittsburgh Central Labor Union;* Henry Stanley, G. Pavlich, *del. Union Label Council;* J. V. Sipe, D. V. Flask, Sr., P. P. Mach, D. D. Martin, *del. IA Convention;* Aaron D. Hopkins, *del. Tri-State Convention.*

LOCAL 199, DETROIT, MICH.

Dwight F. Erskine, *pres.;* Mel E. Donlon, *vice-pres.;* Roy R. Ruben, *fin.-sec.;* Don Lewis, Jr., *rec.-sec.;* Joseph A. Sullivan, *treas.;* Gilbert E. Light, *bus. rep.;* Jack Colwell, Jr., *7th member;* Max Kolin, *sgt.-at-arms;* T. J. (Bud) Kirby, Garry Lamb, James Powers, Jr., *trustees;* Owen Blough, Gilbert Lubin, Louis Ramsey, *del. Detroit and Wayne County Fed. Labor;* O. Blough, J. A. Sullivan, *del. Michigan Fed. Labor;* D. F. Erskine, G. E. Light, R. R. Ruben and J. A. Sullivan, *del. IA Convention.*

LOCAL 219, MINNEAPOLIS, MINN.

Francis May, *pres.;* Frank S. Rogers, *vice-pres.;* Joseph Ellwood, *fin.-sec.;* Rudolph Peterson, *rec.-sec.;* Frank Schilken, Jr., *bus. rep.;* F. Schilken, Wallace J. Yutzy, William Nickey, Al Harris, Dale Freer, *exec. board.;* Darold Louiselle, *sgt.-at-arms;* Ralph Berneck, D. Freer, *trustees;* Al Kuiper, Robert Wittels, Robert Gretson, Harry Thielvoldt, Harold Peterson, *exam. board:* James A. Sauer, W. J. Yutzy, *del. Central Labor Union.*

LOCAL 230, DENVER, COLO.

J. W. Dooley, *pres.;* Leland Brand, *vice-pres.:* R. E. Waller, *sec.-treas.;* Dan M. Kelley, *fin. sec.-treas.;* Charles P. Weber, *bus. rep.;* Dave Jinacio, *sgt.-at-arms;* H. L. McHew, G. L. Campbell, R. L. Boyd, *trustees:* J. Dooley and C. Weber, *del. IA Convention.*

LOCAL 249, DALLAS, TEXAS

G. L. ("Pappy") Luther, *pres.;* Hershel Miller, *vice-pres.;* Harvey D. Hill, Jr., *corr.-sec.;* Charlie I. Cross, *fin.-sec.:* Austin E. Ballard, *treas.;* Harvey D. Hill, Sr., *bus. rep.:* James Blaydes, *sgt.-at-arms;* Sam Hoffman, Jasper Barron, Luther Clark, *trustees;* P. D. Jackson, H. D. Hill, Sr., C. J. Moore, *del. Dallas Central Labor Council.*

LOCAL 294, PHOENIX, ARIZ.

James McCrary, *pres.;* Don Hanna, *vice-pres.;* Charles Kendall, *rec.-sec.;* Dan J. Fisk, *treas.;* Cecil Waters, *bus. rep. (projectionists);* Nuggett Cornell, *bus. rep. (stage hands);* Richard H. Lizarrago, *sgt.-at-arms;* Paul J. Stevenson, *trustee.*

LOCAL 343, OMAHA, NEBR.

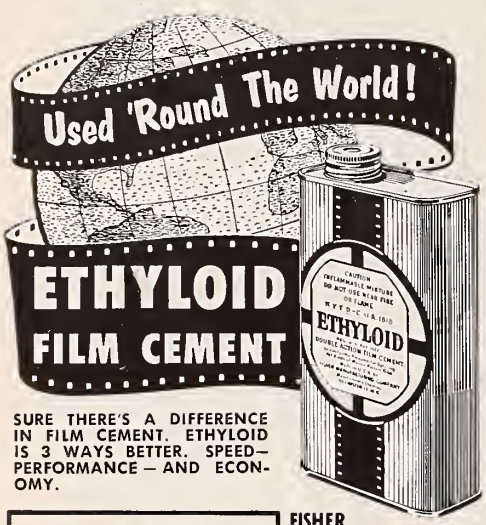
O. Farmsworth, *pres.;* V. Beck, *1st vice-pres.:* C. Jones, *2nd vice-pres.;* J. Kelly, *fin.-sec.:* Clyde Cooley, *rec.-corr. sec.;* Ross Hatton, *treas.;* Howard Jackson, *bus. rep.;* Al Frazier, *sgt.-at-arms;* R. L. McIntyre, Clyde Blubaugh, Art Krake, *trustees.*

LOCAL 407, SAN ANTONIO, TEX.

Dan G. Quinones, *pres.;* A. H. Hildebrandt, *vice-pres.;* Henry Villapadierna, *sec.-treas.;* James W. Good, *rec.-sec.;* D. A. Taylor, *bus. rep.;* Manuel Ayala, Albert P. Slavin, *members at large.*

LOCAL 650, WESTCHESTER COUNTY, N.Y.

Patsy Colarusso, *pres.;* Donato DePalo, *vice-pres.;* Joseph A. Schappach, *fin. sec.-treas.;* Michael J. Nugent, *rec.-cor. sec.;* Anthony Dente, *bus. rep.;* Francis X. Blatzheim, Albert E. Bell, *trustees.*



SURE THERE'S A DIFFERENCE IN FILM CEMENT. ETHYLOID IS 3 WAYS BETTER. SPEED—PERFORMANCE — AND ECONOMY.

AVAILABLE AT ALL THEATRE SUPPLY DEALERS

FISHER MANUFACTURING CO.
1185 Mt. Read Blvd
Rochester 6, N. Y.

YOUR BEST BUY

U. S. SAVINGS BONDS



STILL the lowest... and one of the finest...

HILUX

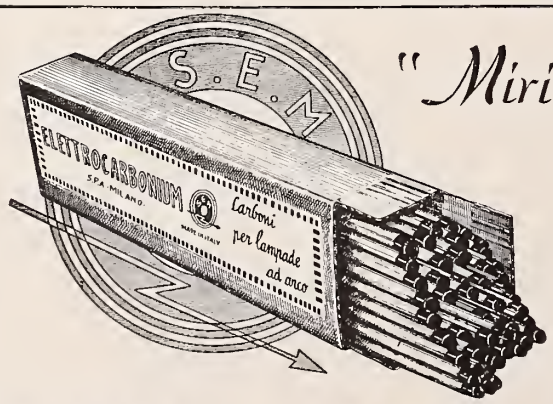
264 & 152

FIXED & VARIABLE ANAMORPHIC LENSES

$197.50 EACH $395.00 PER PAIR

See your Theatre Supply Dealer or write us directly . . . NOW

PROJECTION OPTICS CO.
ROCHESTER, NEW YORK



"Mirio"

ELETTROCARBONIUM

VIA BORGHETTO. 5 — MILANO (Italy)

THEATRE FIRE HAZARDS

(Continued from page 14)

inflammable (nitrate) film and safety (acetate) film in theatres.

Inflammable film. Not more than 50,000 feet may be stored in a theatre. Not more than 25,000 feet may be stored in each of the following: special store room, a rewinding room, and the projection room. A standard reel of inflammable film contains not less than 1,000 feet and not more than 2,000 feet while a sub-standard reel contains not more than 1,000 feet of film. Not more than 8 large standard or 16 sub-standard reels may be stored in I.C.C. containers in a theatre.

Safety film. Not more than 150,000 feet may be stored in a theatre. Not more than 65,000 feet may be stored in any of the following: a special store room, rewinding room, and in the projection room.

Any film in excess of the above must be kept in metal cabinets or in special store rooms. The metal cabinets should be ventilated to the outer air and be equipped with a sprinkler system inside the cabinet. No sprinkler system is needed, however, if the cabinet is constructed with partitions, so that one film burning out will not affect another film. Partitions should be metal or asbestos lined.

In New York City motion picture projectionists are under the jurisdiction of the department of water supply, gas and electricity. B. F. Greene supervising chief inspector in charge of projectionists, and also a member of NFPA, expressed satisfaction with the results of the recent inspections of projection rooms. As a group, he said, projectionists are "on their toes" and "doing a fine job."

Lieut. Leahy also had praise for projectionists. He said he gets "100% cooperation" from them. "It isn't very often we have to remind a projectionist about something," he added, "but when we do, it's taken care of immediately."

Rules and Regulations

There is a chart containing rules and regulations for projectionists in every movie theatre in New York City. These rules and regulations are set down by the commissioner of water supply, gas and electricity and are (1) for the renewal of license to operate motion picture apparatus: (2) for the conduct of licensed projectionists.

Other large municipalities have similar charts in projection rooms. As many of the items have fire prevention in mnd, they are worth repeating here for the interest of projectionists everywhere.

1. Dried film or film with torn sprocket holes shall not be used and its presence in the projection room shall be reported.

2. The projectionist shall report promptly every defect in the apparatus or its connections, the correction of which he is unable to secure.

3. The projection room shall at all times be kept clean. No pieces of film or loose combustible material shall be allowed to remain there, unless kept in a metal box provided with a close fitting cover and construction without solder.

4. No film other than that on the projecting machine or on rewinder shall be exposed in the booth at any time.

5. No match, fire or open light is permitted in the projection room while the public is on or has access to the premises.

6. Magazines attached to the projection machine shall not be utilized for the storage of film overnight, or at any time that the motion picture theatre is considered closed.

7. Every film fire, together with the apparent cause thereof, shall be reported within 24 hours of the time the fire occurs.

8. Advance report shall be made of the installation of motion picture ap-

New Safety Encyclopedia

A new expanded 1341-page edition of the Accident Prevention Manual has been published by the National Safety Council, Chicago, Ill. This third edition, priced at $13.50, is the basic reference on safety. Included in the many new and revised sections of the book is much valuable information regarding fire prevention, electrical hazards, flammable liquids, and many other subjects.

THE ACE CUE MARKER

The World's Best

One push to left or right and all cues are finished. Marker available in 2 sizes for 16- or 35-mm Standard, Tv, or CinemaScope.

Price $29.50

SEE YOUR DEALER OR WRITE TO

ACE ELECTRIC MFG. COMPANY
1458 Shakespeare Avenue
New York 52, N. Y.

Your doorman may be a dream...



Your usherettes may be starlets...



BUT EVERY PERFORMANCE STILL MUST BE PERFECT!

For a perfect performance, vital operating equipment has to work without a single slip. The best man to keep it exactly that way is an expert RCA Theatre Service Engineer. He's the *only* man who brings to your house the full backing of RCA's technical resources.

RCA®

RCA SERVICE COMPANY, INC.

A Radio Corporation of America Subsidiary — Camden, N.J.

paratus for one-night exhibition.

To conclude then, what is most needed for adequate fire prevention, is what the majority of projectionists have been practising all along — and that is common sense. Common sense simply means not taking chances when you don't have to, when a few simple steps will make you a sure winner. Such a sensible attitude plus a knowledgeable application of certain basic precautionary measures make the best approach to preventing fires.

PROTECT YOUR EQUIPMENT WITH

DIT-MCO's Double "T" Type Auxiliary Atomic Jet Lamp House

BLOWER

Exhausts that extreme af higher amperages. Keeps lamps and stacks cleaner by constantly exhausting carban ash and gasses.

- Increases reflector life.
- Permits operation with lawer amperage.
- Reduces carbon consumption.
- Allows greater light efficiency.

For 6' ar 8" pipe (Write us an ather sizes)

$32.50 each



Designed far thase situations where it is impractical to install Single Stack Blawer. A "T" type blower is installed by connecting the two lamp house stacks to the atomic blawer and exhaust to side where space permits.
This blawer aids considerably in exhausting heat and gasses fram projectian raam.

Install Today and Save Money

DIT-MCO's NEW PORT HOLE BLOWER

Designed for New Wide Pictures As Well as Standard Projection

Keeps Expensive Equipment Clean



Prevents Dust, Rain, Flies, Bugs and Greasy Lints from Damaging Expensive Coated Lens.

OPERATOR DOES NOT HAVE TO WIPE LENS AT END OF EACH REEL

$34.20 each

Maunts flush at parthole and designed to pass freely all CinemaScope and wide-picture prajectian. Special feature allows projection beam ta pass freely regardless of prajectian angle. Has slide closure when not showing.

Designed for Both Drive-ins and Indoor Theatres.

Install today and save money by keeping your lens, saund and projection equipment free af dirt.

Write or Wire for Full Details, Prices on all items

DRIVE-IN THEATRE MFG. CO. Division af DIT-MCO

"World's Largest Manufacturer af Drive-In Theatre Equipment"

505 W. 9th Street, HArrisan 8007, Kansas City, Ma

ACOUSTICS IN PROJECTION

(Continued from page 11)

narrow structures. These theatres are reverberant and alive with echoes — acoustic characteristics which served to increase the volume and musical brightness of the small orchestras and pipe organs often used to accompany silent pictures. And the theatres built primarily for vaudeville shows and plays, although comparatively free from echo effects, were purposely made sufficiently reverberant to reinforce the voices of live performers.

Difficult Auditoriums

Electrically amplified sound, such as that used for sound movies, cannot tolerate the "liveness" of the nineteenth-century music hall. The large proportion of low-frequency components in amplified speech tends to create a rumble that blurs the dialogue and makes the sound seem too loud even though no one can understand all that is being said.

The "reverberation time" of an auditorium may be determined by special electrical apparatus or by a series of rather simple, but time-consuming, calculations based on the shape and size of the auditorium, the materials used, and the furnishings and decorations. Since we require only a rough estimate, an easy test will serve our purpose admirably.

Get someone to stand on the stage in front of the screen and clap two flat sticks together sharply. (This procedure is used in movie-making to get a film-synchronizing mark on the soundtrack.) Listen to the clap from a seat near the middle of the auditorium and note whether the sound dies away quickly or persists as a faint roar for a number of seconds. If the sound dies out within one second, the auditorium is not too reverberant to make good sound reproduction impossible.

Checking "Back-Wall Slap"

The "clap-stick test" also provides an opportunity to check for echoes — especially "back-wall slap." The test should be repeated several times while the observer (preferably the chief projectionist) listens from a number of points in the auditorium. Back-wall slap is a distinct echo most noticeable in the down-front area. Ceiling slap may be heard from almost any place except the balcony. Side-wall slap is most audible in the rear of the auditorium and in the balconies.

In theatres not having sound-absorbing panels on the back and side walls, the combination of back-wall and side-wall slap may produce a rapid succession of echoes as the sound bounces back and forth. The ceiling may contribute to the echo by reflecting the sound from one wall to another, and then down into the seating area. Domed ceilings are especially troublesome because they reflect sound into one part of the auditorium, distorting the sound in that particular area.

Wall slap may be minimized by

Navy Converts to C'Scope

The Paromel Electronics Corp. of Chicago, manufacturer of 35-mm motion picture sound projection equipment formerly produced by the DeVry Corp., has supplied the Navy Dept. with modernization kits for over 200 Naval Shore 35-mm projection installations. The kits are designed to facilitate conversion to CinemaScope projection with optical sound. The Altec Services Corp. of New York aided in this latest Navy modernization program.

CONEMATIC-100
80A — 140A
Arc of the Century
DOC FAIGE & ASSOCIATES
113 W. 42 St., N. Y. C.

SPLICES NOT HOLDING ?

Film breaks are costly. Play safe by using

JEFRONA

All-purpose CEMENT

Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.

CAMERA EQUIPMENT CO.
Dept. J-2-8
1600 Broadway New York 19, N. Y.

covering the walls with acoustic panels, preferably in irregular areas. An occasional tapestry is not enough — ozite or rock wool should back the decorative cloth panels. Perforated acoustic tile is frequently used; and this may be decorated with water paints. Oil paints should not be used, as they form a sound-reflecting hard surface.

"Boomy" and "hollow" resonance effects are produced whenever the walls vibrate under the impact of sound waves and reinforce certain frequencies. The effect is very similar to frequency distortion in a speaker system. Brick and concrete walls seldom give this kind of trouble; wood walls and walls faced with plasterboard resonate very readily when subjected to sound frequencies corresponding to their natural period of vibration.

It is not within the province of the projectionist to attempt the acoustic treatment of theatre auditoriums. The job demands the services of a specialist — an acoustic engineer — who is trained to track down the causes of faulty acoustics and make specific recommendations for their correction.

Positioning HF Speakers

Regardless of the faults of the auditorium, however, the projectionist and sound-service engineer can make sure that the positioning of the HF speaker units is such that ceiling slap, side-wall slap, and back-wall echo are reduced to an absolute minimum. Attention need be given to the HF units only, as the LF speakers are so non-directional that their position (except in relation to the HF units) has little effect upon the quality of the sound.

Ceiling slap is reduced by tilting the HF horn downward so that direct sound is thrown into the seating area and does not strike the ceiling. Considerable care must be exercised in theatres having balconies so as to avoid robbing the balcony areas of high-frequency sound. (Speech deficient in high-frequency harmonics is almost unintelligible.) It is best to tilt the HF horn downward gradually while an observer in the rear of the balcony listens to a recording of female speech, the LF speakers being disconnected for the test. The best angle is the one where loss of volume in the balconies *just begins* to occur.

Special care must be taken during this adjustment not to disturb the distance of the HF horn from the screen.

Side-wall slap is properly corrected by placing effective acoustic panels on both side walls. Where this cannot be done, the *upper outside* cells of the HF horn may be plugged with loosely packed wool yarn.

Back-wall slap. Where there are no balconies, the HF horn may be tilted downward so that direct sound is just heard in the last row of seats. As a last resort, the entire speaker assembly may be moved to one side of the screen and pointed to give proper distribution of sound. This change alters the reflection pattern; but if back-wall slap is still noticeable after the speakers have been moved off the center line, they should be returned to their original position. Acoustic treatment of the back wall and the balcony front is then a "must."

It sometimes happens that the balcony is ignored altogether when positioning the speakers. A great deal depends on whether the balcony is in daily use, of course, for nothing is gained by sacrificing sound quality in the orchestra level to insure good

BODDE SCREEN CO.

Announces Price Reductions

EFFECTIVE FEBRUARY 1ST. 1956

Automation + New Plant + Volume Buying = LOWER PRICES

Bodde Premium Seamless Screens
Now Priced and manufactured
to Sell for $1.18 SQ. FT.
Effective Feb. 1st, 1956

SAME! Heavy Duty Screen
SAME! Famous & Guaranteed Qualities
SAME! Custom made & scientifically engineered surfaces
6 Aluminized Reflective Surfaces
3 White Matte Reflective Surfaces

BODDE SCREEN CO.
11541 Bradley Ave. • San Fernando, Calif.

for VistaVision, CinemaScope

Lorraine ORLUX SUPER-CHARGED LARGE-CORED Carbons

For DRIVE-INS & THEATRES with HUGE, WIDE-AREA SCREENS • CARBONS, Inc. BOONTON, N.J.

and all other Wide-Screen Presentations

hearing conditions in an *empty* balcony. In theatres where the balcony is always open, this writer prefers to aim the HF units at the last row of seats in the orchestra, thus insuring a measure of direct high-frequency radiation in the balcony area. Patrons in the balcony have a right to hear more than the muffled sound of the LF units.

Whenever the speakers are aimed at either the back wall of the orchestra or the front of the balcony, careful listening tests should be conducted in an empty theatre to determine whether this positioning of the HF speakers causes excessive back-wall slap. A reel of film having staccato sound effects, such as pistol shots, may be run. Annoying back-wall slap may require sacrificing sound quality in the balcony to insure distortion-free sound in the orchestra. The matter is worth investigating in all theatres having balconies.

Stereophonic, or 3-channel, speaker systems require special attention in regard to phasing and positioning. The distribution of sound from the three speaker combinations is often noticeably uneven. Good stereophonic sound can be obtained only in theatres having almost perfect acoustics. Much of the criticism directed against stereophonic sound may be attributed to faulty theatre acoustics.

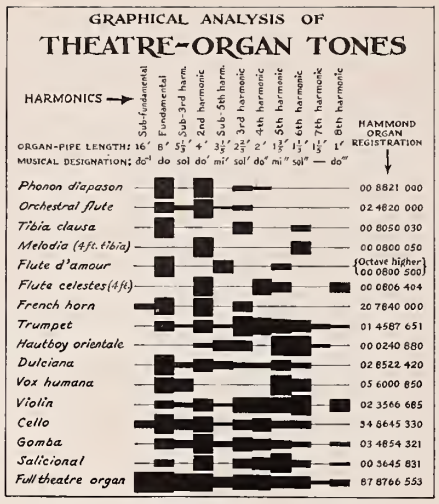


FIGURE 2

(The "sobby" tibia was a favorite accompaniment to tear-jerking scenes in silent movies.) The flute d'amour, in which the sub-5th and 5th harmonics predominate, is deliciately sweet as well as pensive. The 4th, 5th, and 8th harmonics of the flute celestes produce a sweetly vivacious brilliance.

The French horn, like the diapason, is lacking in the higher harmonics, and therefore dull in tone. The organ trumpet, on the other hand, is the most brilliant of reed stops. The hautboy (oboe), because of its strong 5th and 6th harmonics, is nasal and oriental-sounding; while the more regular harmonic pattern of the dulciana gives an accordion-like tone. Different from these is the vox humana. This tone is lacking in the middle harmonics and has a strong sub-3rd, giving a low, intimate, vibrantly warm reed quality. The 5th and 6th harmonics of the vox humana help provide the effect of a human voice, especially when tremulated.

Stringed Instrument Sounds

The violin, cello, viola da gamba, and salicional are "string" stops characterized by rich harmonics. Predominating 3rd, 4th, 5th, and 6th harmonics added to a weak fundamental result in a violin-like tone. The gamba is more reedy than the violin or cello, while the salicional, having a strong 5th harmonic, is piquantly sweet.

The full theatre organ — all stops coupled together — produces the powerful tone resulting from large proportions of all harmonics. The strong sub-fundamental comes from "16-ft. stops" which are pitched one octave below the regular 8-ft. stops. Many of the higher harmonics are enhanced by the fundamentals of 4- and 2-ft. stops pitched 1 and 2 octaves, respectively, above unison 8-ft. pitch. With dozens of stops to combine in various ways, the organist can produce thousands of new tones.

These tones may be duplicated more or less perfectly on the Hammond electric organ, even though that interesting little instrument lacks the important sub-5th and the less important 7th harmonic.

MUSIC AND ACOUSTICS

(Continued from page 11)

tent of sustained organ tones is easy to evaluate and interesting to engineers because sound systems must be capable of reproducing at least the first 8 or 12 harmonics to provide natural sound reproduction.

Tone quality, like color, is a matter of proportion. If one or two harmonics are altered, the character of the tone changes: if all component frequencies are increased or decreased by the same proportion, the tone becomes either louder or fainter, but retains its original quality.

Familiarity with the distinctive quality of the different organ tones analyzed in Fig. 2 helps us to understand how the different harmonics affect the tones in which they are present. The phonon diapason is distinctly fluty, even though heavy and dull, because of the predominance of the fundamental and 2nd harmonic. The tibia clausa is the theatre-organ flute "stop" *par excellence*: its 3rd and 6th harmonics impart to its tone an emotional, pathetic quality.

How Many?

Was this copy dog-eared when it came to you? How many men read it ahead of you?

You would receive a clean, fresh copy if you had a personal subscription—and you wouldn't have to wait—you would be first to read it.

Use coupon below.

INTERNATIONAL PROJECTIONIST,
19 West 44th St., New York 36, N. Y.

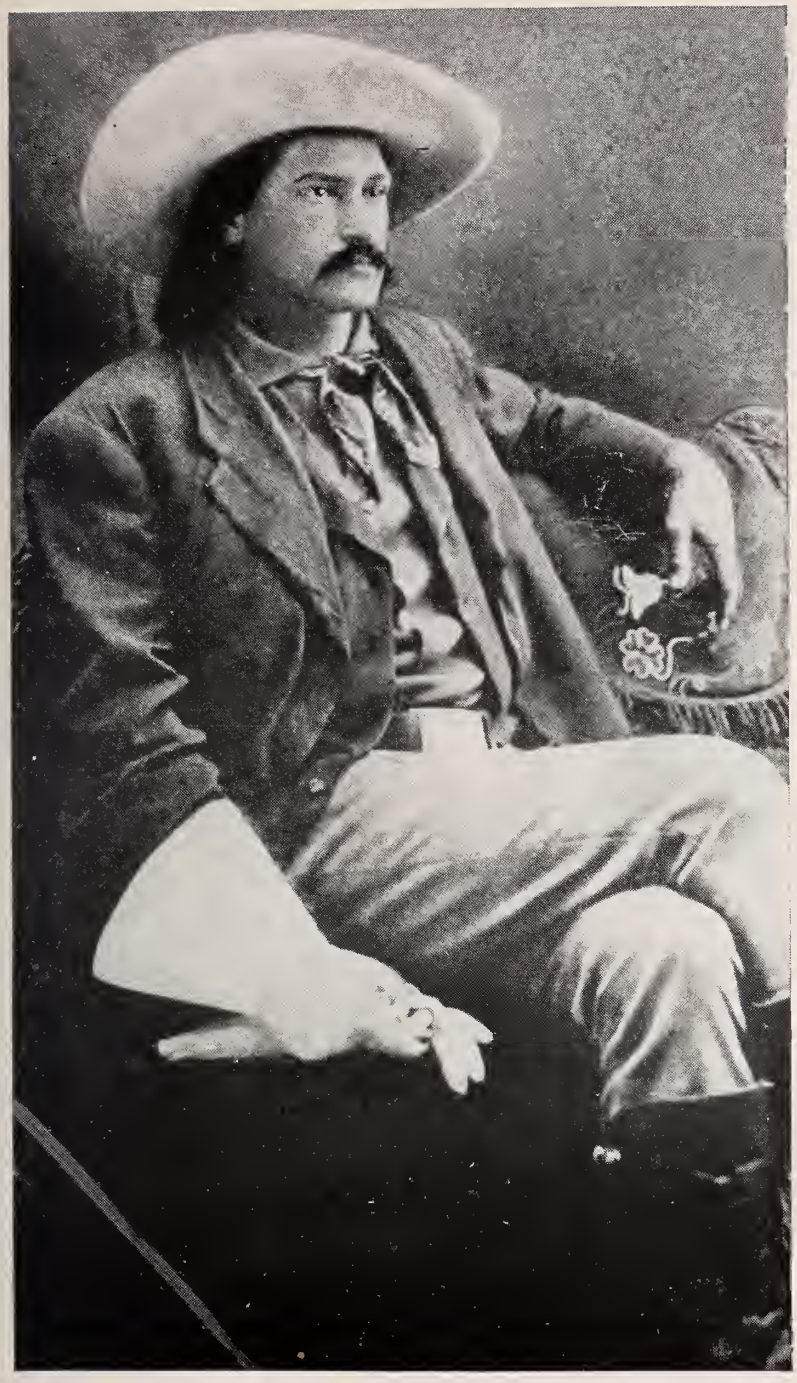
Enter my subscription for
☐ 1 year—12 issues—$2.50
☐ 2 years—24 issues—$4.00

Foreign and Canada: Add 50c per year.

Name .....

Address .....

City..... Zone..... State.....



His calling card had claws on it



LUTHER KELLY lied about his age and got into the army at 15. They sent him West in 1865, and he stayed.

He liked the wilderness. Game abounded. In Trappers' Lake, "trout were so thick they obscured the bottom."

Hostile Indians were also pretty thick. But when two tried ambushing him, he killed both with his Henry .44.

He learned Sioux and sign language.

One day, he visited General Miles, sending a huge fierce-clawed bear's paw to Miles as his calling card. Miles made him chief scout against the Sioux.

But by 1885, the country was taming down, and Yellowstone Kelly left it.

Two decades later, Teddy Roosevelt praised the heroic treasurer of Surigao in the Philippines who saved the town from outlaws. Name: Luther S. Kelly.

Yellowstone Kelly's body now rests at Kelly Mountain in Montana. But his restless, pioneering spirit lives on in the heart of today's America. For it is the trail-blazing courage of 165 million people that makes America great, and that provides the real strength behind one of the world's finest investments: our country's Savings Bonds.

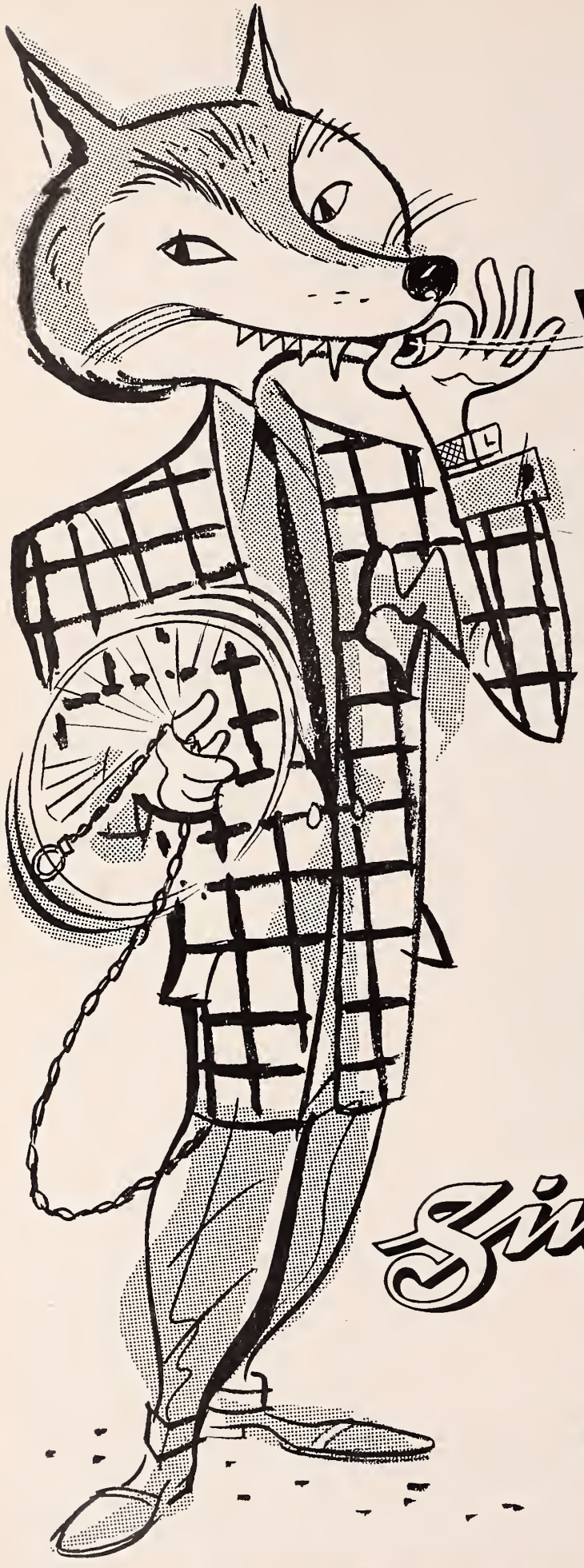
Why not guard your security with this strength? Invest in U.S. Series E Savings Bonds. And hold on to them!

It's actually easy to save money—when you buy Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done *for* you. The Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, when held to maturity. And *after* maturity they go on earning 10 years *more*. Join the Plan today. Or invest in Savings Bonds regularly where you bank.

Safe as America—U.S. Savings Bonds

The U.S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

PUBLIC SERVICE ADVERTISING COUNCIL



LEAVE THE WHISTLING TO THE WOLVES

Mr. Projectionist, they won't be whistling and carrying on to adjust the focus, sound, size, etc. . . . not if you're running a SIMPLEX X·L, that is!

SIMPLEX X·L sound and projection equipment has an unparalleled reputation for smooth, trouble-free service. That's why almost every top theatre in America is SIMPLEX equipped. And that's one of the many reasons why it belongs in your booth too!

Simplex X·L

T.M. REG. U. S. PAT. OFF.

PROJECTION and SOUND SYSTEMS

MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION • DISTRIBUTED BY NATIONAL THEATRE SUPPLY

SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

582938

PROJECTIONIST

INTERNATIONAL



MARCH 1956

VOLUME 31 • NUMBER 3

30c A COPY • $2.50 A YEAR

THE LIBRARY OF CONGRESS SERIAL RECORD
MAR 30 1956
COPY

No lamp in the World!

CAN PRODUCE SO MUCH LIGHT.

Peerless HY-CANDESCENT TRADE MARK REG

CINEARC

NOT A REFLECTOR ARC!

WRITE FOR DATA

Peerless MAGNARC TRADE MARK REG

CINEARC

A 75-77 AMP. REFLECTOR ARC!

22,000 TOTAL LUMENS ON SCREEN

NO-HIGH-RATE *OF ($60.00) REFLECTOR BREAKAGE AND SILVERING DETERIORATION OR HEAT FILTER UPKEEP* !

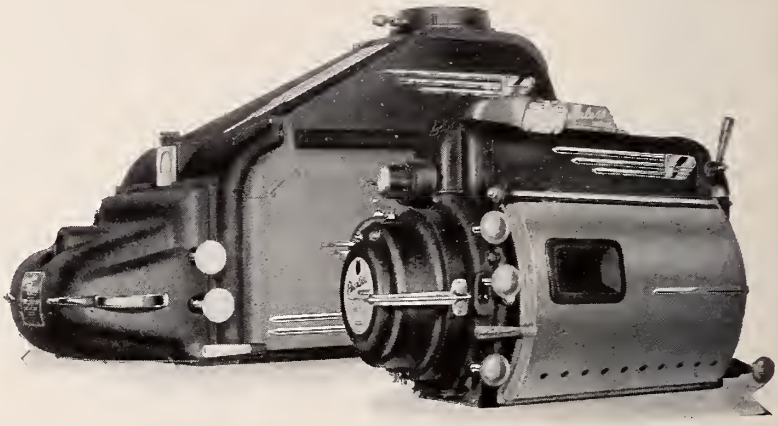
PROOF

Hy-Candescents were selected for all **important** "CINERAMA" installations. (Chicago, New York, Los Angeles, San Francisco, Philadelphia, and Washington, D. C.)

Hy-Candescents were chosen by Paramount for all installations of Horizontal "VISTA-VISION".

Hy-Candescents were again selected by TODD-AO for "OKLAHOMA".

You have to do the same if you want all the light there is for big pictures.



At 75-77 amperes . . . With presently available and standard 8 x 9 m/m copper coated carbons . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . With a 14" diameter No. 2012 PEERLESS "Hy-Lumen" glass reflector that retails at a list price of $22.00 F.O.B. Chicago . . . With a No. 2880 PEERLESS Tail Flame Flue . . . On any kind or any size screen . . . No Heat Filter required.

All of this, at the **lowest** possible first, and operational **cost**. And ———————

J.E.McAULEY MFG.CO.

552-554 WEST ADAMS STREET

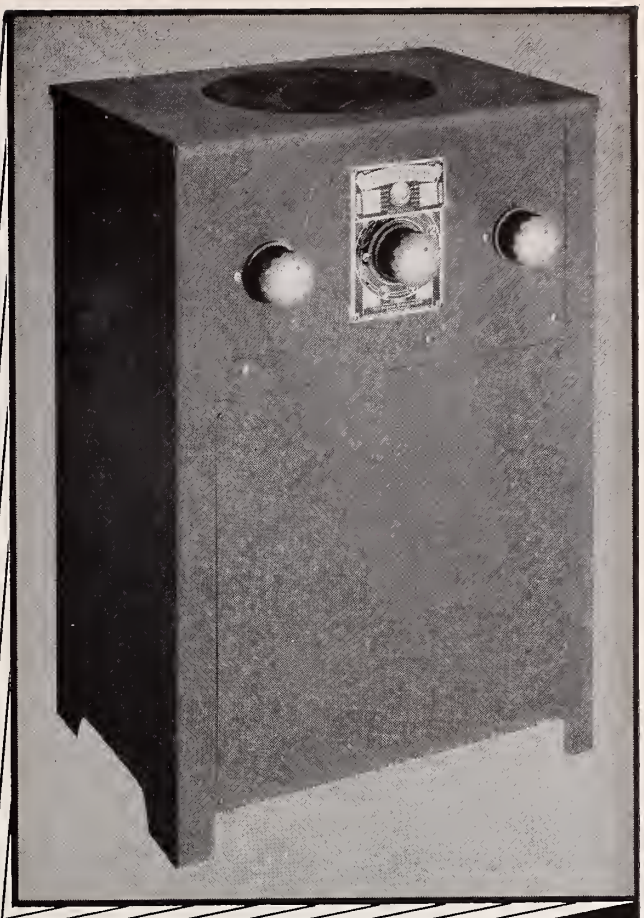
CHICAGO 6, ILLINOIS

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

MAR 29 1956 B 582998

B 582998

NOW



A LOW COST,

HIGH QUALITY

RECTIFIER

especially designed

for use with angle or coaxial trim

high intensity projection

arc lamps

The New

Excelenium

90 to 135 Ampere

3-Phase

Selenium Rectifier

★ *Convenient output control.*

★ *Moisture-proofed plates assure dependable operation in damp climates.*

★ *Ventilated by heavy-duty fan.*

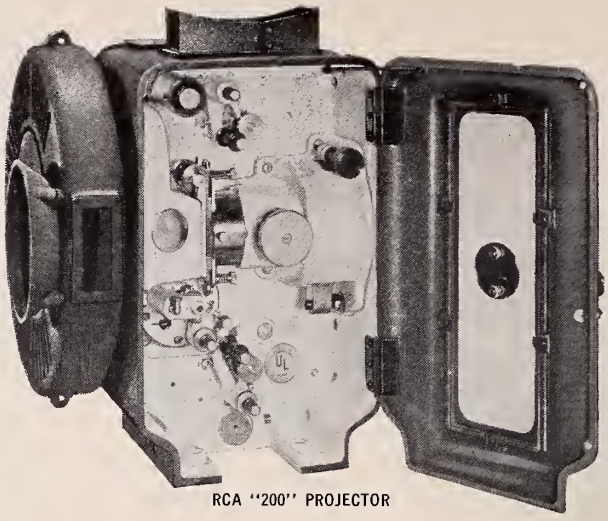
IT'S FROM N.T.S

NATIONAL THEATRE SUPPLY

Division of National • Simplex • Bludworth, Inc.

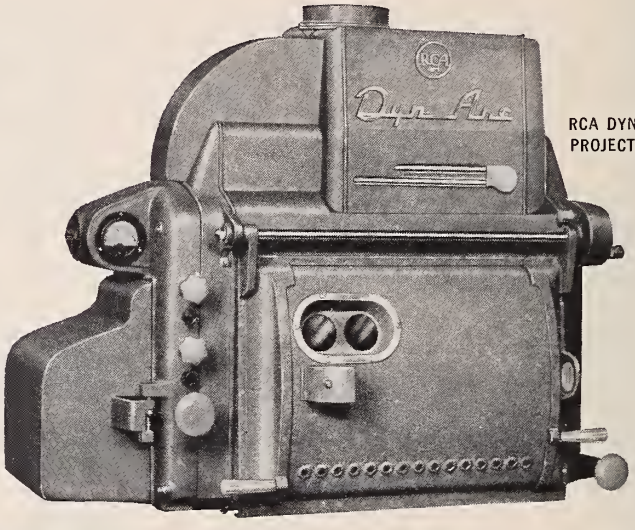
A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

2



RCA "200" PROJECTOR

for the show . . sharpest, steadiest show you ever rolled



RCA DYN-ARC
PROJECTION LAMP

(that goes for drive-ins or regular houses!)

There's a clear advantage for you in this great show business team . . . RCA's "200" Projector and RCA's Dyn-Arc Projection Lamp. It's an advantage wise exhibitors recognize right away . . . pictures that stay sharp and clear.

Advance-engineering and precision manufacturing stand back of the rock-steady performance and smooth film travel of an RCA "200" Projector. Automatic loop setting aids easy threading. There's a minimum of moving parts, which means simplified maintenance and quietest operation. 4" lens mount supplied with adapter for Series II lenses.

A reflector-type lamp producing *high-level* light at ⅓ the operating cost of condenser-type lamps . . . that's RCA Dyn-Arc. It's thoroughly efficient with all of today's carbons, technically advanced for lighting needs of the future. High-speed reflector projects maximum light. Complete heat dissipation system keeps operating temperature low. Use Dyn-Arc with *f*1.9 or *f*1.7 lenses for screens up to 145 feet.

Drive-in or indoor . . . patrons come back for more of the quality performances you screen with this stand-out equipment team . . . the RCA "200" and Dyn-Arc. For a pleasant surprise, talk costs with your independent RCA Theatre Supply Dealer. He has the full story ready for you *today!*

the Line that builds Lines at Your Box-Office

RCA THEATRE EQUIPMENT

RCA

THEATRE EQUIPMENT SALES
RADIO CORPORATION of AMERICA
CAMDEN, N.J.

International PROJECTIONIST

R. A. ENTRACHT, *Publisher*
JAMES MORRIS, *Editor*
R. A. MITCHELL, *Contributing Editor*

Volume 31 MARCH 1956 Number 3

Index and Monthly Chat 5

Film and the Heat Problem 7
ROBERT A. MITCHELL

Cinemiracle to Use Transistorized Amplifiers 12

Special Projection Process Gives 'Fantasia' New Look 14
NORMAN WASSERMAN

The Versatile Claw Intermittent 16
JOSE RUIZ

Letters to the Editor 19

In The Spotlight 20

New Incandescent Lamps 22

Ray Brian's Movieana Archives, VIII 23

What Do You Know About Carbons? VI 24

Personal Notes 25

Book Review 28

Obituaries 29

IA Elections 29

Mobile Cinerama Installation for Atlanta 30

Miscellaneous Items, News Notes, Technical Hints

INTERNATIONAL PROJECTIONIST, published manthly by the International Projectionist Publishing Ca., Inc., 19 West 44 Street, New York 36, R. A. Entracht, President. Telephone: MUrray Hill 2-2948. Subscriptian Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Ara Baak Depat, Ltd., 64 Caurtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sans, Ltd., Macklin St., London, W. C. 2. Subscriptian Rates: United States and U. S. Possessians, $2.50 per year (12 issues) and $4.00 for twa years (24 issues). Canada and Fareign countries: $3.00 per year and $5.00 for twa years. Changes af address shauld be submitted four weeks in advance af publicatian date ta insure receipt of current issue. Entered as secand-class matter February 8, 1932, at the Past Office at New Yark, N. Y., under the act af March 3, 1879. INTERNATIONAL PROJECTIONIST assumes no responsibility for persanal opinians appearing in signed articles, or far unsalicited articles. **Entire cantents copyrighted 1956 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.**

420

Monthly Chat

The Drive-In Projectionist

COMPLAINTS about dim, hazy screen images at many drive-in theatres were voiced at last month's convention of drive-in theatre exhibitors in Toledo, Ohio. This trouble stems partly from the fact that many drive-ins were quickly erected in the least expensive way to take advantage of the sudden boom in that field. Then screens were later expanded in a haphazard manner to conform with changes in projection technique. Some theatre owners always feel compelled to safeguard their interests by holding their investment to a minimum. It is sometimes forgotten that it is the picture on the screen, and nothing else, that will attract customers. If the strain of watching the screen is so great as to produce a headache rather than entertainment, extended refreshment breaks won't help weak profit margins. The customers just won't be there.

What can the projectionist do about all this? Not much sometimes, but often quite a lot. As the only technically-trained and experienced craftsman always present at a drive-in theatre, he should be able to advise the manager on the quality of the picture and the efficiency of the projection equipment. He should have a clear idea of what is possible on the giant outdoor screens that the public has grown to expect. This is not always easy because the drive-in field is still without screen-brightness standards. To aid in clarifying this problem, next month's issue of IP will be devoted to drive-in theatre equipment.

Dangerous Statistics

A RESEARCH organization recently came up with a report that most patrons seem to regard motion pictures as a form of narcotic. The report, made by the Willmark Research Corp., stated that about 85% of customers queried in theatres answered that they attended to relieve the tensions of everyday problems. About 23% also answered that they went to movies twice a week.

There is nothing startling about these figures: the purpose of most entertainment, motion picture or otherwise, is to relieve tensions and relax people. However, research reports of this kind have been quoted by exhibitors to prove the fallacy of the current Hollywood policy of concentrating on fewer but better pictures and advocating better and more impressive projection methods. Many exhibitors look back nostalgically to the good old days of assembly-line entertainment. Certainly, they're partly right. A bill that's changed once a week, or even less often, doesn't tap the sizable but diminishing market of habitual movie goers.

But the hard fact remains that catering to the industry's old friend, the habitual patron, is not going to lure the gigantic lost audience back to the theatre. This lost audience can be attracted only by quality entertainment, and not by narcotic fare no better than the Tv programs which can be seen at home for free. Although every attempt must be made to provide exhibitors with as much product as possible, the future of theatre exhibition depends on two factors, the ability of Hollywood to supply really good pictures, and theatres to present them with the very best in projection skill and equipment.

Strong SPOTLIGHTS for

Schools
Theatres
Hotels
Auditoriums
Stadiums
Arenas
Fairgrounds

The Brightest Spots In Any Show!

Sparkling light aplenty—quiet, convenient, flickerless. A sharp edged spot from head to flood. Fast-operating, 6-slide color boomerang. Two-element variable focal length objective lens system. Horizontal masking control angles 45° in either direction. Mounted on casters for easy portability.



The New

SUPER-TROUPER

The first direct current high intensity arc spotlight with built-in power conversion unit. Extremely high powered. Draws only 10 amperes from the 220 volt A.C. power source. Silvered glass reflector. Automatic arc control. Burns 80 minutes without retrimming. Ultra-violet filter holder. Spot intensity variable from full brilliancy to dark. Selenium conversion units and color gelatins cooled by blower.



TROUPER ARC SPOTLIGHT

—with adjustable self-regulating transformer in base. Fully automatic arc control. Plugs into any 110-volt outlet. Burns 80 minutes without retrimming. Silvered glass reflector. Ultra violet filter holder.



TROUPERETTE INCANDESCENT SPOTLIGHT

Plugs into any 110-volt outlet.

Arrange for a demonstration now! See your theatre or stage equipment dealer, or send coupon for free literature and prices.

THE STRONG ELECTRIC CORPORATION
31 CITY PARK AVENUE • TOLEDO 2, OHIO

Please send free brochures and prices on Strong
( ) Trouper; ( ) Trouperette; ( ) Super-Trouper.

NAME_____
STREET_____
CITY & STATE_____

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

INTERNATIONAL PROJECTIONIST

VOLUME 31 MARCH 1956 NUMBER 3

FILM and the HEAT PROBLEM

By ROBERT A. MITCHELL

Heat filters and sometimes water and air cooling are needed when powerful arclamps are used for projection. Otherwise the film may buckle so much that it cannot be kept in focus.

MOTION-PICTURE film is essentially "still" film adapted to uses foreign to orthodox photography. The edge-perforated 35-mm film designed by Thomas A. Edison for use in his Kinetograph, the first motion-picture camera, was nothing but George Eastman's snapshot film applied to the novel art of motion-picture photography. Eastman, a photographic genius whose wide interests extended to art and serious music, invented the first practical flexible film in 1889 for his Kodak cameras, and Edison employed this new roll film in the same year.

The only significant difference between "still" and movie film, even today, is the slightly thicker base, or emulsion support, used for movie film to give it greater mechanical durability. The support material, popularly called "celluloid" (formerly cellulose nitrate, but now non-inflammable cellulose acetate), is the same for both types of film.

The Blazing Arc Spot

"Still" film is never subjected to the severe conditions of heat and physical stress prevailing in motion-picture projection. Movie film is spared complete destruction only because it is drawn so rapidly through the blazing "spot" of concentrated arc light. But even the standard speed of 1 ½ feet of 35-mm film per second is not quite fast enough to prevent film damage in drive-ins and other theatres having the most powerful arc-lamps.

Film is exposed to the beam of the arc-lamp frame-by-frame as it travels through the projector gate, or film trap. In projectors having front shutters, each individual film-photograph is "flashed" by the hot arc beam for 1/24 of a second. When rear shutters are used, as in all modern theatre machines, each frame receives two 1/96-second flashes of light—a total of 1/48 of a second. This is just half of the really scorching exposure the film gets in old-fashioned front-shutter mechanisms.

The rather frightening combination of intense radiation and explosively inflammable nitrofilm was a necessary condition of theatre projection during the first half century of commercial motion pictures. (Eastman Kodak introduced satisfactory safety film in the late nineteen forties.) The projectionist, unseen showman and unsung hero, lived dangerously indeed before the advent of theatre-release safety stock. He faced most emergencies with a single predominating thought—film fire and its prevention. Human life depended upon his clear thinking and quick action.

In the days of nitrate film, the possibility of film fire concerned the projectionist every time an increase in arc power was contemplated, or whenever an old front-shutter mechanism was pressed into service as a "spare." And an accidental slow-down of the projector motor took him to the lamp dowser with lightning speed to avert disaster. The safety of the audience is always the prime consideration.

Quality Projection

The projectionist is still concerned with the effects of heat on film even though he knows there is no danger of being burned alive or asphyxiated by the fumes of smoldering nitrate film. Eastman safety film burns even less readily than paper. By eliminating the element of danger, safety film allows attention to be devoted entirely to the effects of heat on the *quality* of the projected images.

The popularity of the drive-in theatre and the use of wider screens in nearly all theatres have made the heat problem extremely serious by requiring significant increases in the intensity of the radiant energy concentrated

upon the film at the projector aperture. The widespread use of short-focus (wide-angle) lenses magnifies projection defects that formerly went unnoticed, and higher arc currents increase such defects as focus-ruining film flutter, "breezing" and in-and-out of focus defects, and blistered emulsion.

As every projectionist knows very well, jammed film in the projector gate results in a "burn-out" of one frame. A rectangular hole the size of the aperture is actually burned right out of the film. Only a small fraction of a second is needed to produce a burn-out. In many cases the standard rate of film travel is just barely enough to prevent the film from being scorched to a crisp. Even so, the gelatine emulsion which carries the photographic images is sometimes blistered and charred even by a single showing of the film at the highest arc currents. At somewhat lower currents the print may escape physical damage, but the absorption of energy by the emulsion results in in-and-out of focus buckling. And in nearly all cases, alternating expansions and contractions of the film caused by heat produce a flutter so rapid that a sharp focus cannot be obtained on the screen.

Reducing Heat

Various preventive measures have been advocated by lamp and projector manufacturers to make possible the satisfactory projection of pictures at excessively high arc amperages, and without damage to the film. The merit of these various aids to successful high-power projection is evaluated on the basis of their efficacy in reducing the temperature of the film emulsion during its exposure to the radiant energy focused upon the aperture by the arc-lamp mirror or condensing lens.

The most effective cooling means yet devised is without doubt the rear shutter of the projector head. The old-style front shutter, while very efficient as an "occulting" device, unfortunately allowed the hot blaze of light to play upon each frame of film even while the "balancing" blade of the shutter in front of the lens cut off light from the screen. Accordingly, each frame was exposed to the beam twice as long as it is in modern projectors having rear shutters. The rear shutter, moreover, divides the brief exposure of each frame into two 1/96-second flashes separated by a 1/96-second interval of darkness. This helps to restrict the focus-ruining expansions and contractions of the film.

Because all present-day projectors have rear shutters, we need not consider the shutter further as a cooling device. We have the rear shutter, and we are very grateful for it. But when our lamps consume more than 75 or 80 amperes, something more than a rear shutter is needed for reducing the temperature of the film. And we are given a choice of minus-infrared heat filters to be interposed in the light beam between the lamp and the head, blowers to bathe the film in a stream of relatively cool air, cooled carbon jaws, and water-cooled film gates. Are these additional film-cooling devices *really* effective? That is the question we intend to answer definitively in this article.

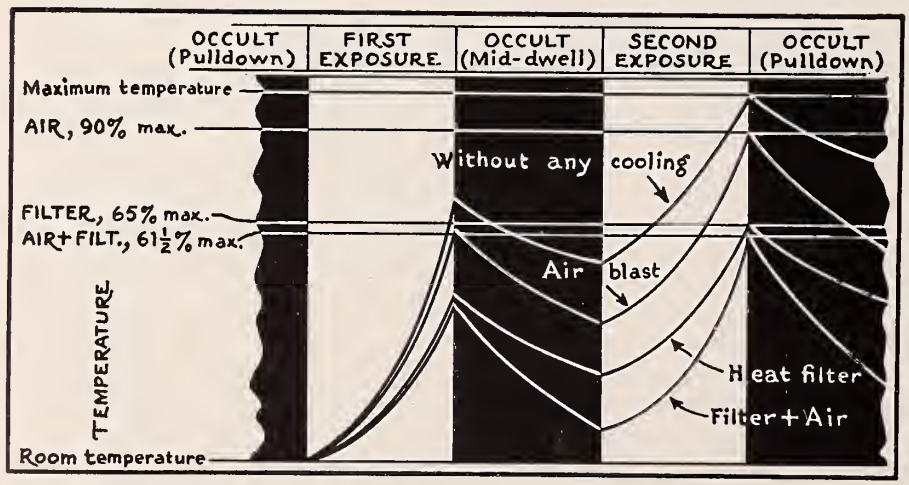
Film absorbs heat in two ways. Most of the heat taken up by film during projection comes from the hot metal gate runners and aperture tension pads which contact the perforation margins and hold the film flat and steady over the aperture. A smaller amount of heat comes from direct irradiation of the film as the tiny frames shuttle past the light. Strangely, however, it is not the heat absorbed by direct conduction from the gate, but the heat absorbed by the emulsion from the arc beam that is responsible for most of the trouble.

Measuring Heat

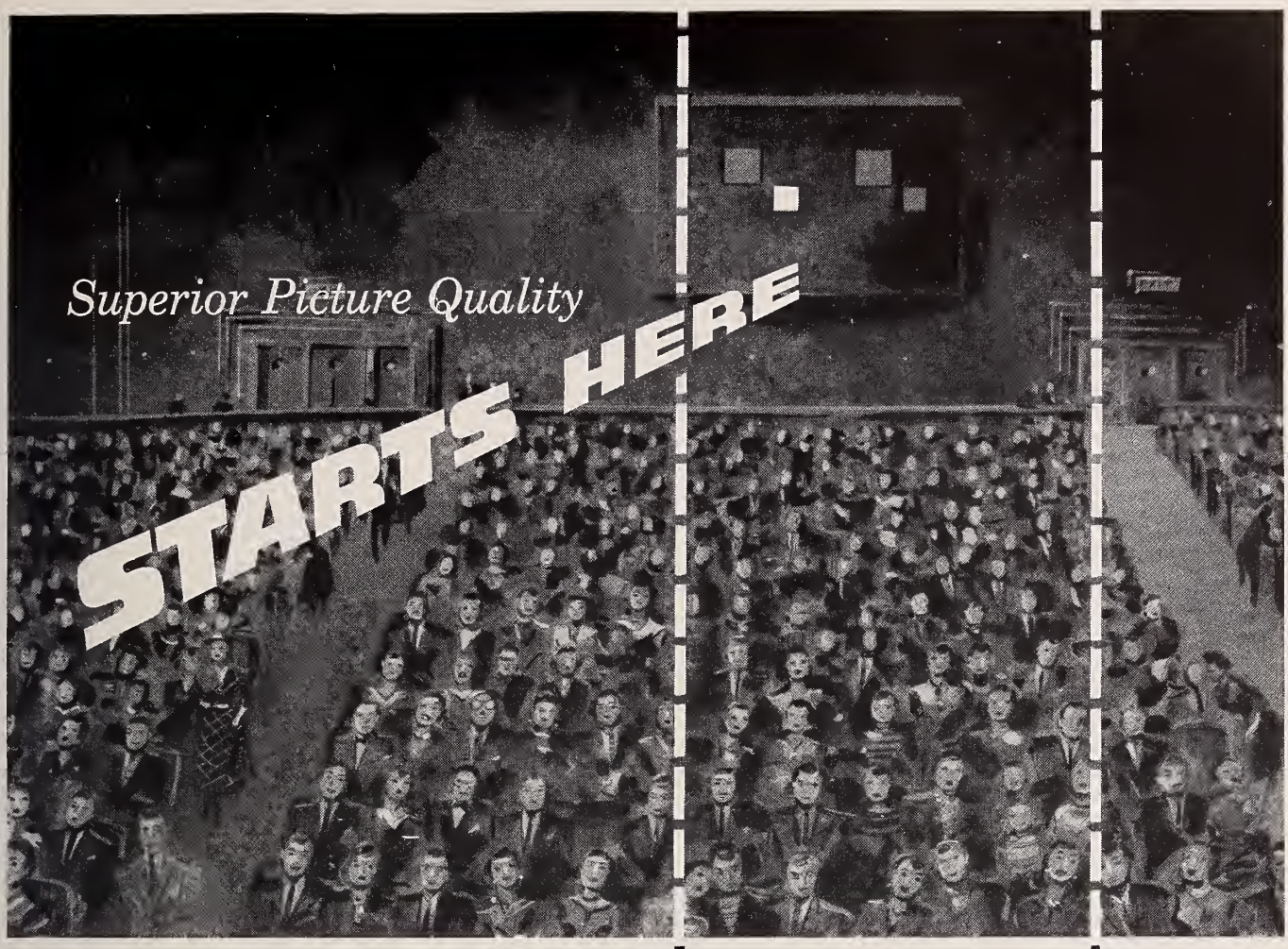
The *amount* of heat absorbed by film is measured in calories; the *intensity* of heat is measured in degrees of temperature. Even though the edges of the film absorb the larger amount of heat (calories), the arc-lamp exposed emulsion attains the higher temperature (degrees). It is the high temperature to which the surface of the emulsion is raised during the brief flashing intervals that causes flutter, buckling, etc. In fact, this temperature may even get high enough to blister and burn the emulsion. It often does in large drive-in theatres.

We wish to make it especially clear that it is the photographic *emulsion* of the film, not the base of transparent plastic, that absorbs damaging amounts of heat. The emulsion is more or less opaque in areas of dark pictorial detail, and these areas absorb radiation rather well. The surface skin of the emulsion may get extremely hot while the lower layers remain relatively cool when flashed by the arc beam. If the "mean," or average, temperature of the emulsion exceeds 80 degrees Centigrade (176 degrees Fahrenheit), the gelatine decomposes and burns, producing on the film the characteristic grayish-brown spots of charred emulsion. (Viewed from the base side of the film, the charred emulsion has a milky appearance.)

Whenever radiation — ultraviolet rays, visible light, or infrared rays— is absorbed by a photographic image or by anything else, heat is generated. More precisely, radiation is a form of energy that turns into heat, another form of energy, when absorbed. Even though we frequently speak of the heat of an arc beam, or the heat of visible light rays, infrared rays, etc., all forms of electromagnetic radiation are actually without heat until they



The relationship between emulsion temperature and shutter phase, comparing the effects of various cooling means. Note that the film cools off more quickly with air cooling when the shutter blade closes off the light. It can also be seen that minus-infrared heat filters are more efficient than air cooling of the film, although, of course, both may be used in combination.



when you specify

NATIONAL
TRADE MARK

PROJECTOR CARBONS



THE PICTURE IS LIGHT... GIVE IT ALL YOU CAN WITH "NATIONAL" CARBONS

FOR TWO GENERATIONS of movie-goers, the right carbons—"National" Carbons—have assured the finest possible picture on America's movie screens. And the advantages of "National" Carbons don't end there. This superior picture quality is delivered to the theatre owner at a cost per unit of light and length of carbon burned that is the *lowest obtainable anywhere!*

For highest quality at lowest cost, continue to specify "National" Carbons. It pays in customer-satisfaction *and* in economy of operation.

The term "National" is a registered trade-mark of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY • A Division of Union Carbide and Carbon Corporation

30 East 42nd Street, New York 17, New York

SALES OFFICES:

Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco

In Canada: Union Carbide Canada Limited, Toronto

are absorbed by matter.

The heating effect of all forms of radiation, visible and invisible, is the same when the intensity of the different radiations is the same. The prevalent idea that infrared rays are "heat rays" and that visible light has little or no heating effect is erroneous. Visible light is exactly as heat-producing as infrared radiation, and ultraviolet rays have just as much heating effect as either. Each wavelength of radiation from an "equal-energy" source, such as an Orion-type star, has the *same* heating effect as very other wavelength; and the fact that human eyes can perceive only those wavelengths between 380 and 780 millimicrons, and are totally blind to shorter (ultraviolet) and longer (infrared) wavelengths, is immaterial.

The heating power of arc-lamp radiation, therefore, can only be reduced, never wholly eliminated. If the invisible radiations are removed by suitable filters, the heating effects due to those radiations will be gone; but the visible light, which also produces heat, will remain. There is no such thing as "cold light" (that is, light which produces no heat when absorbed). The strongest, and therefore "hottest," wavelengths in carbon-arc radiation are not in the infrared region of the spectrum at all, but occur in the visible region. Low-intensity arc radiation "peaks" at 630 millimicrons (orange-red), and the radiation of the high-intensity projection arc peaks at about 520 millimicrons (green).

Why Mirrors Crack

Now, substances that *transmit* light completely, such as perfectly transparent glass, or *reflect* light completely, such as a perfect mirror, cannot be warmed by even the most intense arc-lamp radiation! Perfect transmitters and reflectors of light simply don't exist, of course. The clearest coated projection lenses absorb from 5 to 25 per cent of the light passed through them, and arc-lamp mirrors absorb from 15 to 30 per cent of the visible light and a large proportion of the longer infrared rays, turning both into heat.

The radiation absorbed by a lamp mirror is so uniformly distributed over the large surface that the glass expands evenly and does not shatter. A spot of soot on a mirror, black and radiation-absorbing, gets so hot that the mirror cracks when the internal stresses exceed the strength of the glass.

The radiation absorbed by film also turns into heat. The clear base absorbs very little light, and accordingly gets most of its heat by thermal conduction from the hot metal of the gate. Because the amount of heat absorbed by the emulsion depends upon its opacity, a dark, or "dense," print is heated to a higher temperature during the brief time of exposure to the arc beam than is a light, or "thin," print. Dye-image prints, being relatively transparent to heat-producing infrared radiation, don't get as hot as silver-image prints, which absorb both the visible and the infrared rays. Color films, therefore, are very resistant to the deleterious effects of arc-lamp radiation.

The heating effects of the ultraviolet rays present in the light reflected by the arc-lamp mirror are negligible. In any case, condensing lenses, heat filters, draft deflectors, and other glasses between the lamp and the projector head absorb much of the ultraviolet radiation. (Ordinary crown glass absorbs ultraviolet rays shorter than 330 millimicrons in wavelength, while heavy flint glass absorbs ultraviolet rays shorter than 350 millimicrons. Most heat-filter glasses pass ultraviolet rays down to about 310 millimicrons. The limit of visibility at the extreme violet end of the spectrum is 370 millimicrons.)

Despite the "actinic," or chemical, activity of the ultraviolet radiation present in the light of the HI carbon arc, projectionists need be concerned only with the heating effects of the visible light and the infrared radiation.

Heat from Infrared Rays

The infrared rays are responsible for approximately 70 per cent of the total amount of heat produced by the radiation of low-intensity mirror lamps, and very nearly 50 per cent in the case of high-intensity mirror lamps. It must be understood that silvered glass mirrors, not metal mirrors, reflect these proportions of infrared and visible wavelengths from LI and HI arcs. Metal mirrors reflect the longer infrared rays which glass mirrors absorb. In addition metal reflectors also absorb more light than glass mirrors. Therefore, rhodium-plated mirrors can increase heating of the film, the projector mechanism, and the lens. Glass mirrors are preferable for theatre projection where light or heat is a problem.

When considering the benefits of "minus-infrared" heat filters, it is important to bear in mind that the heating effect of HI mirror-arc radiation is about equally divided between the visible light rays and the invisible infrared rays. All of the heating caused by *visible* light (about 50% of the total amount of radiant heat) is unaffected by the presence of a heat filter.

Approximately 65% of the heat which would otherwise be generated by the infrared radiation is absent

RADIANT FLUX watts/mm²	LUMENS (f/2 lens) 50% shutter		SIMPLIFIED HI MIRROR LAMP		ROTATING POS. HI MIRROR LAMP		MAX. TEMP. (°C.) OF SILVER FILM EMULSION-CENTER FRAME 24 frames/sec., Rear shutter—			
	WITHOUT HEAT FLTR.	WITH HEAT FLTR.	Amps	Crater Candles	Amps	Crater Candles	NO FILM COOLING	WITH HEAT FILTER	WITH AIR BLAST	WITH FILTER & AIR
0.15	2,750	2,500	40	14,000	---	------	27	18	24	17
0.20	3,750	3,250	43	15,000	---	------	36	23	32	22
0.25	4,750	4,250	45	16,000	---	------	46	30	41	28
0.30	5,500	5,000	55	17,000	---	------	55	36	50	34
0.35	6,500	6,000	65	20,000	---	------	64	42	58	39
0.40	7,500	6,750	75	24,000	80	35,000	73	47	65	45
0.45	8,250	7,500	85	29,000	90	40,000	82	53	74	50
0.50	9,250	8,250	---	------	100	45,000	91	59	82	56
0.55	10,000	9,000	---	------	120	50,000	100	65	90	62
0.60	11,000	10,000	---	------	130	60,000	109	71	98	67
0.65	12,000	10,750	---	------	140	65,000	118	77	106	73
0.70	13,000	11,750	---	------	150	70,000	127	83	114	78
0.75	14,000?	12,500?	---	------	200	?	137	89	123	84
0.80	15,000?	13,500?	---	------	300	?	146	95	131	90

EFFECT OF HEAT ON FILM:

Black-and-white film projects satisfactorily in this range.

In-and-out flutter, but no damage to emulsion.

70°

Emulsion blisters, film destroyed.

80°

The relationship between radiant flux and arc current with associated data on the heating of black-and-white film both without and with heat filters and air cooling. Because the luminous efficiencies of different mirror lamps vary greatly, depending largely upon adjustment by the projectionist, the values in this table are only approximate.



Mastery of picture-taking and laboratory technics have freed today's motion picture production from the practical limitations of time and space. For example, should director and crew be in Hollywood with story scenes to be photographed in New York, the director shoots background and action separately, combines them in the optical department.

There's an Eastman Motion Picture Film for every purpose



To aid the industry in solving problems such as this, Kodak maintains the Eastman Technical Service for Motion Picture Film with divisions at strategic centers. Inquiries invited.

Address: Motion Picture Film Department

EASTMAN KODAK COMPANY, ROCHESTER 4, N. Y.

East Coast Division	*Midwest Division*	*West Coast Division*
342 Madison Avenue	137 North Wabash Avenue	6706 Santa Monica Blvd.
New York 17, N. Y.	Chicago 2, Illinois	Hollywood 38, Calif.

when a heat filter is used. This is because the filter absorbs about 65% of the infrared rays thrown forward by the arc-lamp mirror. Such a filter occasions a loss by reflection and absorption of about 10% of the useful visible light—an insignificant loss in view of the improvement in picture quality made possible by the filter.

Now, because the filter removes 65% of the heat due to the infrared and about 10% of the heat due to visible light alone, the total heat absorption is approximately 38% with a 10% light loss. In other words, heating of the film is only about 62% or 63% of what it would be without the filter. If the luminous output of the arc is increased by 10% to compensate for the light loss, heating of the film becomes 69% of what it would be without the filter and the light increase. A great deal of careful thought should be given to the selection of heat filters because inferior types transmit too much infrared and absorb too much of the visible light.

Equally important is the matter of the *need for heat filters.* They are not needed in all theatres, by any means. It is foolish to use them with small simplified HI lamps burning only 40 or 50 amperes. In fact, the use of heat filters with mirror lamps burning even as much as 65 amps. results in a waste of about 10% of the light and accomplishes no discernible benefit as regards projection quality.

In theatres where arc currents of from 70 to 80 amps. are used, heat filters may or may not improve the appearance of the picture by reducing rapid flutter of the film in the gate. The luminous efficiency of the lamp optical system is involved. This is a factor depending not only upon the quality of the mirror or condenser, but in a large measure upon the adjustment and alignment of the entire lamp together with its optics and carbons.

Lamp Efficiency

We have known of lamps so efficient that black-and-white emulsion has been blistered at a current of only 75 amperes; but the average HI mirror lamp can burn about 5 amps. more than this before the luminous flux becomes strong enough to endanger the gelatine emulsion of even a dense print. If effective air-cooling of the aperture is an integral feature of the projector mechanism, the arc current may be increased to about 85 amps. in simplified HI mirror lamps, or to about 90 amps. in rotating-positive HI mirror lamps, before blistering of the emulsion is likely to occur.

The projectionist, therefore, must exercise his own best judgment in regard to the use of heat filters when burning about 75 amps. in simplified HI lamps. If the filters improve the focus of the picture, it should be remembered that 10 per cent of the visible light is wasted by reflection and absorption. Reducing the arc current to 67 amps. will cut down screen light by about 10 per cent and cut the heat down to safe limits, though not so efficiently as a filter.

SIMPLIFIED HI MIRROR ARC:

	Heat	Light
75 amps., no filter:	100%	100%
75 amps., heat filter:	63%	90%
67 amps., no filter:	90%	90%

Minus-infrared heat filters should always be used with simplified HI mirror arcs burning 85 amps. or more, and with rotating-positive mirror arcs burning 90 amps. or more. These are the currents that produce violent flutter of the film, in-and-out of focus effects, and incur the risk of blistering the emulsion of black-and-white prints.

Many drive-ins and other large theatres have projection lamps that consume 100 amps. or more. How much current can be burned before projection quality suffers, or the film undergoes damage, even when good heat filters are installed?

Filter Limitations

Careful tests made with rotating-positive HI mirror lamps using standard non-cooled carbons and heat filters indicate that flutter and in-and-out of focus begin to become noticeable at 130 amps., on the average, and become especially troublesome at 140 amps. At 150 amps. the emulsion blisters,

(*Continued on page* 33)

Cinemiracle to Use Transistorized Amplifier

The gradually mushrooming transistor movement is beginning to invade the motion picture field. Announcement was made recently of a deal between Cinemiracle Corp. and RCA involving the use of RCA stereophonic film recording equipment, which includes filmdom's first transistorized seven-track mixer amplifier. Under a lease agreement, Cinemiracle, three-projector wide-screen cousin to Cinerama, will have the new equipment for its first production.

Transistors already have been used in television recording and reproducing equipment, with increasingly favorable results. Small transistor portable radios are now becoming more and more frequent. It is not inconceivable then, that transistors will be used some time in the future in the reproducing apparatus of motion picture theatres.

A transistor, briefly, is a tiny, very simple substitute for the vacuum tube. Among its chief advantages is its economy of size, weight and power consumption. According to H. D. Bradbury, RCA's manager of film recording, theatre and sound products the new RCA transistorized amplifier is only a fraction of the bulk of conventional recording amplifiers and requires 25-times less power.

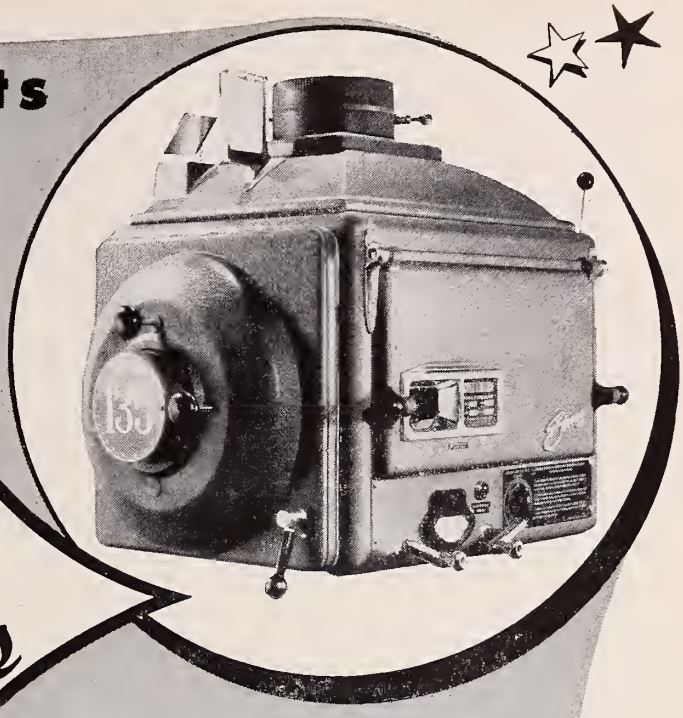
"The successful application of transistors," Bradbury said, "makes it possible to build seven-track equipment into a package which is as small and light as single-track equipment using electron tubes. The transistorized amplifier is smaller than an overnight bag, compared with the trunk-like dimensions of tube-type multi-channel stereophonic equipment."

The stereophonic sound recording system to be used by Cinemiracle will include RCA seven-track high-quality playback equipment, as well as other equipment to transfer daily sound recordings to magnetic tape for editing. Recorder and playback equipment will be installed in a truck as Cinemiracle's initial effort, "Seven League Boots," calls for many outdoor scenes.

Elmer Rhoden, president of National Theatres, owner of worldwide rights to the Cinemiracle process, pointed out that the combination of RCA's transistorized amplifiers with seven-track stereophonic recording and Cinemiracle's high film speed—146.25 feet per minute—can be expected to introduce new realism and fidelity in motion picture sound recording.

Producer Louis de Rochemont has leased the Mount Eden Theatre in New York City as production base for Cinemiracle's first picture. The Cinemiracle process utilizes three cameras on a single tripod for taking, and three projectors in a central booth for projection. It is reported that a system of electronically controlled lenses makes possible a composite merging, with maximum precision, of the three separate films on a single ultra-wide screen.

Why Proponents of the New Projection Techniques Are *Switching to Strong Lamps*



Strong engineers, working with the developers of the various new projection processes, have been enabled to not only meet present screen lighting demands but to anticipate future requirements.

New conversion features engineered by Strong to fit into Super 135 projection arc lamps, to assure perfect screen lighting for the new 55, 65 and 70 mm wide film productions are now ready for your adoption. When you equip for any of these projection techniques, provision can be made for burning the 20-inch 13.6 mm carbons. A wider opening can be provided in the nose of the lamp, it can be fitted with a new dowser which fully covers the bigger opening, and a new high magnification mirror.

OUTSTANDING FEATURES OF THE STRONG SUPER 135 INCLUDE:

★ 18" f 1.7 or 16-1/2" f 1.9 reflector.

★ Infra Ban Beam Cooler. Diverts heat rays from aperture. Removable holder. Easy cleaning. Blower cooled.

★ Reflector and frame cooling device.

★ Exclusive Lightronic system controls the burning of both carbons. Automatically maintains positive arc crater at the EXACT focal point of the reflector. A perfect light, evenly distributed, of constant intensity and unchanging color value, is maintained WITHOUT MANUAL ADJUSTMENTS—exactly the same for both lamps. Changeovers cannot be noticed. Eliminating the need of hand feeding and correction of the carbon crater position, better enables the projectionist to render a good presentation of the more complicated techniques.

★ Burn a choice of four carbon trims, 9, 10, or 11 mm regular and 10 mm Hitex, to attain any desired degree of cast of operation, screen illumination, or burning time. Quick, simple changes attain the correct light requirements for VistaVision, CinemaScape, Cinerama, or any other presentation technique—even two or more on the same program. A TRULY ALL-PURPOSE LAMP!

★ Single control amperage selection.

★ The arc is stabilized by its own magnetic field (no magnets are required) and an air jet. Prevents deposit of soot on reflector.

★ Unitized component design.

★ Long-life positive carbon contact. Water-cooled carbon contact assembly (optional).

Impartial Foot-Candle-Meter Tests Will Prove that the Strong Super 135 Projects the Brightest Pictures Today.

THE STRONG ELECTRIC CORPORATION

"The World's Largest Manufacturer of Projection Arc Lamps"

31 City Park Avenue • Toledo 2, Ohio

Please send free literature on Strong Projection Arc Lamps.

NAME_____

THEATRE_____

STREET_____

CITY & STATE_____

Special Projection Process Gives 'Fantasia' New Look

By NORMAN WASSERMAN

Size of screen image can be automatically expanded or contracted to enhance subject matter of each sequence.

FROM Hollywood recently has come a unique mechanism designed specifically to give a popular old picture a "new look." Walt Disney's "Fantasia," which originally appeared in 1940 and was heralded then as the first motion picture with multi-track sound, is currently being revived and shown via a new projection technique which not only expands the picture image, but having expanded it, also contracts it back to standard proportions many times during the showing. A more effective "Fantasia" than that which came out 15 years ago is thereby achieved.

The Buena Vista Distributing Co., distributor of Disney films, proposes to distribute the reborn product in key cities throughout the country. It was announced that no engagement will be contracted unless the proper equipment for the new mode of projection is installed. The Trans-Lux Normandie Theatre in New York was the first to make the necessary installation and exhibit the film.

Variable Aspect Ratio

Projectionists may remember what "Fantasia" looked and sounded like in the pre-CinemaScope days when it first came on the scene. No one then commented on the size of the screen, because it was the standard 1.33 to 1 ratio that was used for every 35-mm film in those days. The multi-track sound system, however, received much well-deserved praise because it was a daring and successful venture. Today on the other hand, it is not the sound that is talked about, though this aspect also has been further improved upon. Today it is the versatile screening, the right-in-front-of-your-eyes changing of the size of the screen and picture image during the continuous projection of the feature that is worthy of mention.

What happened at the Normandie "premiere" was that the live-action sequences of the film appeared in standard 1.33 to 1 aspect ratio, while most of the cartoon portions came out in 2 to 1 proportions. The resulting contrast, with no break in the performance, was highly effective, making the widescreen scenes appear wider and the smaller screen image more concentrated.

This trick was accomplished by means of a variable anamorphic lens unit coupled to an automatic control mechanism. Because the figures in the cartoon sequences of "Fantasia" do not show effects of distortion even if they are expanded from 30 to 40% horizontally, anamorphic projection can be employed in these cartoon sequences even if the print itself is unsqueezed. The automatic control mechanism set the variable anamorphic at zero when footage of live musicians appeared on the screen, and the picture contracted to 1.33 to 1 proportions.

As the apparatus controlling the picture size operates automatically by electronics, film continuity was never broken. The contraction and dilation of the screen image worked smoothly and rapidly. The shift from standard to widescreen as well as the reverse order shift, was completely executed in 20 seconds.



The original stereophonic soundtracks used for Fantasia. Four optical tracks, three for sound and one for control, filled a separate film strip. In the present reissue, CinemaScope magnetic sound makes it possible to place the same amount of sound information on the same film with the picture. This time, however, the control track is used to cue an electronic system for adjusting a variable anamorphic lens that widens or narrows the size of the picture on the screen.

The mechanism effecting the varying sized pictures is a motor-driven lens control, which was developed by Walt Disney Studio engineers especially for "Fantasia." A flexible shaft connects an electric motor with the anamorphic lens unit. A gear and chain linkage serves to narrow or widen the picture by resetting the prisms. The motor is activated by cue markings on one of the four magnetic sound tracks on the new print of the film.

How Lens Control Works

When the cue marks are reached, an action is set up which changes the "squeeze" ratio of the anamorphic lenses from widescreen to 1.33 to 1 and the reverse. Under such an arrangement, the necessary accompanying changes in the screen masking may be accomplished either manually or electronically. At the Normandie, a push-button system operated by the projectionist enlarges or diminishes the size of the screen at the same time that the anamorphics are undergoing corresponding changes at the projector.

Another difference in the showings of the revived "Fantasia" is that the sound is now carried by magnetic rather than optical sound tracks. The regular CinemaScope striping system is employed, with the program sound appearing on tracks 1, 2 and 3. The fourth track contains only the cues that actuate the lens controlling mechanism. When first released, "Fantasia" employed three optical soundtracks on separate film.

Cues consist of short sections of 7500 cycle tones imprinted at appropriate pre-determined locations along track 4. The projectionist must be sure to have his lenses in correct position for the opening scene of the show. This done, all further changes throughout the entire running of the film are made automatically. Whenever a change does occur, it takes place within 32 feet of running time,

or roughly 20 seconds.

Assuming then that the lenses on both machines are correctly set for the start of the picture, they will remain in that position until the first 7500 cycle tone is reached on track 4. This signal activtates the adjustment mechanism which in turn alters the setting of the variable anamorphic lens to accommodate the next portion of the film. There are a total of eleven changes in actual screen size, standard to widescreen and back, from beginning to end of the picture.

Automatic Adjustment

Two reels of thc feature, Nos. 2 and 3, necessitate a new lens adjustment after run-out in anticipation of a different sized picture at the start of the following reel in each projector, reels Nos. 4 and 5. In each of these cases, a tone signal has been positioned at a point along the track that sets the lens adjusting mechanism into operation just before the changeover. The result is that the lens adjustment takes place after the film has run out so that the lens is already correctly set before the next reel is threaded up.

According to Irving Ludwig, domestic sales manager of the Buena Vista Distribution Co., only those theatres that install the new lens control mechanism will be able to show "Fantasia" in its present reissue form. The first requisite is that the theatre be equipped for both CinemaScope and stereophonic sound. These conditions satisfied, Buena Vista will then provide the necessary units for automatic adjustment of the lenses during performances.

The Trans-Lux Normandie Theatre uses a standard screen size of 12 by 14.6 feet and a wide screen of 12 by 22.5 feet. Each side masking was moved in or out nearly four feet whenever a change of screen was made. The intrinsic interest of the film together with the subtle masking movement made it often difficult to determine when a particular change took place.

All the live-action sequences, in which Deems Taylor and Leopold Stokowski are seen with the Philadelphia Orchestra, appear on standard-size screen; while the majority of the cartoon portions, in which Disney illustrates the music of Bach, Shubert, Tchaikowsky and others are all on widescreen.

It should be noted again that nonc of the sequences were "squeezed" on the reissue prints, so that there is no anamorphic "unsqueezing" during projection, but rather a gradual expansion of the selected sequences. Only the cartoon portions of the film—and not all of these—were selected for expansion. The plain and practical reason for this is simply that Deems Taylor and Leopold Stokowski, if expanded, would probably come out Lew Costello and Jackie Gleason. Even the Mickey Mouse section, illustrating the music of "The Sorcerer's Apprentice," appeared on standard size screen lest Mickey become too flattened out by the expansion process. For most of the other cartoon sequences, expansion served only to enhance; this is especially true of the dramatic dinosaur scenes of the "Rite of Spring."

Limited Application

In its present form, application of the Disney lens-controlling device is necessarily severely limited. No live action picture and even very few cartoons lend themselves to the distortion that must result from expansion where the print is non-anamorphic. "Fantasia" in fact may be the ideal single exception. In any event, plans for marketing the lens-control system have not been determined beyond the current successful adaptation of it to "Fantasia."

The modernized Trans-Lux Normandie Theatre in New York is the first theatre to use the system. The men operating the two Century projectors at the Normandie are projectionists Herman Epstein. Milton Mark, Morris Daniels, and Julius Finklestein, all of Local 306, New York City.

SMPTE Standards Service

A new service, designed to inform motion picture and television engineers of changing standards in their fields, has been initiated by the SMPTE. The service provides for an up-to-date ready-reference file of SMPTE-sponsored American standards.

Subscribers will receive, four times a year, copies of all standards approved during the preceding quarter, at an annual fee of $7.50. In addition, engineers who do not already have copies of all standards approved prior to Dec. 31, 1955, may obtain these in a loose-leaf binder, plus the service for the calendar year starting Jan. 1, 1956, for $27.50.

Standards subscription service order forms may be obtained from the Society's headquarters at 55 West 42nd Street, New York City 36. Copies of the latest standards index and price list are available free of charge.



The many projectionists who take real pleasure in tinkering with machinery in their spare time to devise improvements or short cuts in projection will be particularly amused at this cartoon which apeared recently in "Image," publication of the George Eastman House, Rochester, N. Y. As a young man, George Eastman, the founder of Eastman Kodak Co., worked in a bank and, in off hours, was an earnest student of the then very difficult art of photography. The improvements and short cuts he devised, working alone and on the smallest budget, are the basis of all modern photographic methods.

The Versatile Claw Intermittent

By JOSE RUIZ

A re-examination of this relatively simple and precise mechanism. Although the claw will not stand up under the continuous pounding taken by geneva movements in theatre projection, it still remains highly regarded for a variety of applications to motion pictures.

SINCE the introduction of 16-mm motion picture film and equipment, the most favored mechanism to move the film intermittently has been without doubt the old and classical claw movement. This simple and reliable mechanism was the first practical means of accomplishing the illusion of real movement on the screen.

One of the first machines to utilize the claw movement was the Lumiere *Cinematographe* camera-projector. This machine employed a mechanism of the cam and shuttle type. The movement is illustrated in Fig. 1. A heart-shaped or three cornered cam (A) acting upon a shuttle (B) furnishes the vertical pulldown motion and a drunk cam (C) gives the shuttle claws (D) the motion of entering and leaving the film perforations. The path described at any point by the claws

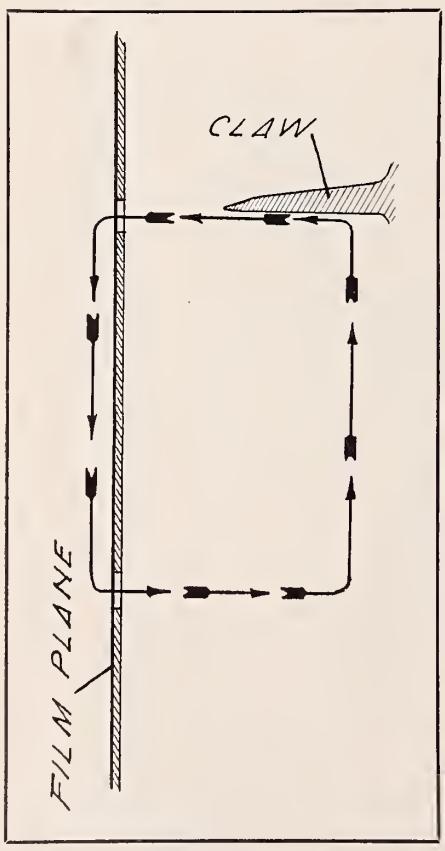


FIGURE 2

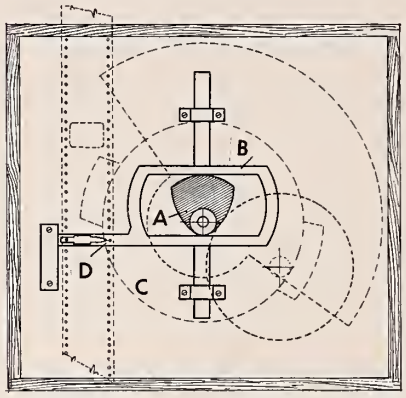


FIGURE 1

is shown in Fig. 2 and takes the shape of a rectangle parallel to film plane and claws. When activated by the cam, the claws move forward, down, backward, and up.

The First Intermittents

Many variants of the claw mechanisms were developed in the early days of cinematography. Fig. 3 shows one of the claw mechanisms used by Darlin. A mechanism employed by early English camera and projector manufacturers is illustrated in Fig. 4. These motions derived from the crank and connecting rod are of the type known as Williamson motions and were classical devices to change circular movement into alternative rectilinear motion.

The path generated by any intermediate point between the crank-pin and connecting end rod is approximately an ellipse. By changing the gyration fulcrum point of the connecting rod end with a swing link, the motion generated becomes a D shaped motion. A projector mechanism employing the Williamson motion is shown in Fig. 5 along with the motion path generated by the claws. This movement was used in many English cameras and projectors. Although this mechanism is known as the Williamson motion, his mechanical principle is much older still and dates back to James Watt.

An early English intermittent movement of the Prestwich type is is illustrated in Fig. 6. This intermittent produced a D-motion similar to the Williamson motion illustrated in Fig. 5. The connecting rod (B) is acuated by the crank-pin on the disk (D) and the alternative motion derived is constrained by the intermediate link (C), producing the motion shown in diagram at H. In order to get a straight path on the pulldown stroke, the claws (A) are secured on the flat spring (G), and the slotted strip (F) which is driven by the connecting rod end (B) at point (J), so when the claws enter the film gate slot (E), the claws are forced by the action of the spring (G) to follow a straight path and pull the film down toward the film gate (K), producing the motion of diagram (I).

Faster Claw Movement

A claw movement producing a rather more rapid shift, is the heart cam employed by Lumiere brothers in their *Cinematographe* in 1895. From then until the advent of the Armat geneva movement, many 35-mm projection

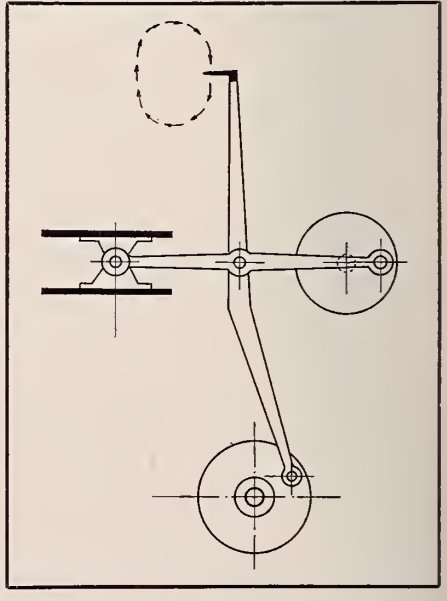


FIGURE 3

machines were designed around the claw intermittent mechanism. About 1908, the Selig Polyscope and primitive Pathe 35-mm projector mechanisms employed claw intermittents. They were widely used in Europe as well as in America until 1910. Then Thomas Armat introduced his star and cam movement and it soon replaced claw mechanisms. This geneva intermittent became the standard movement in all 35-mm projectors manufactured to date.

Claw intermittent mechanisms are universally employed in all kinds of motion picture cameras, printers and

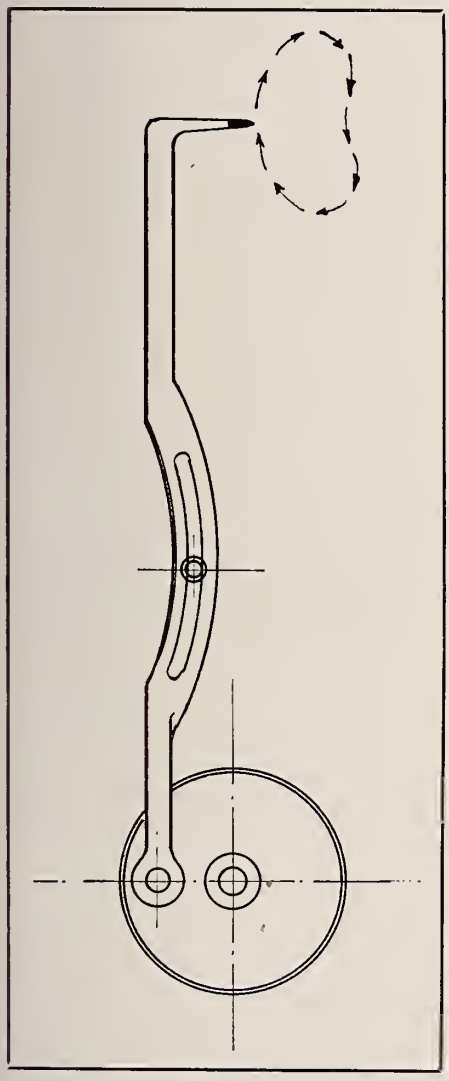


FIGURE 4

background projectors. Usually, the camera mechanism employs a double cam arrangement, one cam to produce the intermittent motion in the claws and the other to actuate the pilot pins. The shuttle-arm point of gyration is adjustable in order to set the shuttle in the most favorable stroke position. The use of a claw mechanism to drive the film intermittently, with pilot pins registering the film perforations always in the same position, is the most efficient means of obtaining intermittent motion and the best known method to obtain a steady level of motion cycle. Figure 7 shows a popular and typical camera mechanism of the double cam design.

Versatile Adaptation

A well known claw intermittent movement used in many American and European 16-mm projectors is illustrated in Fig. 8. This movement is basically the old Lumiere mechanism with some minor improvements. This is a versatile movement because of the variety of pull-down designs to which it can be adapted.

The Lumiere cam may be altered to get a more rapid pulldown cycle. In the case of 16-mm sound film with only a row of perforations, this pulldown shortening may be dangerous far beyond the limits imposed by fixed mechanical conditions and film base properties. One of the inconveniences of very rapid pulldown movements is damage to film perforations, vibrational noises, etc., due to rapid acceleration imposed on the film and mechanical parts. An approach to the ideal intermittent, would be one with slow starting and stopping in the pulldown cycle. The diagram in Fig. 9 shows an ideal 60-degree pulldown claw motion. The variable pulldown property, inherent in the Lumiere cam, is achieved by altering the working angles of cam faces.

Application to Tv

This favorable property of the claw intermittent is very useful in television work. In order to synchronize motion picture film speed to Tv speed (24 to 30 frames per second*), it is necessary to shorten the pulldown cycle to a ratio of almost 5 to 1. This results in a 60-degree pulldown action of the intermittent and accommodates motion picture frame to Tv frame frequency. When the cam design is, by some geometric limitation, unable to reach the desired pulldown time, it is possible after altering the cam angle, to also alter the gyration fulcrum point of the shuttle arm to obtain the wanted pulldown action. These design factors

* The classical star and cam pin as well as the star pin and grooved barrel cam are mechanisms of start and stop motion family, thus all are pure geneva variants of the motion known as "discontinuous motion principle."

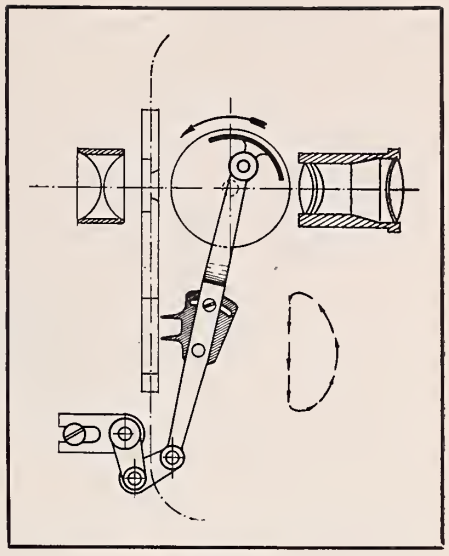


FIGURE 5

make the claw intermittents a very flexible movement when compared with geneva intermittent mechanisms.

The movement of the single cam design has been widely employed by all leading camera and projector manufacturers since the advent of 16-mm motion pictures. One of the most simple claw intermittents is shown in Fig. 10. This claw mechanism has the advantage of easy construction and precision registration. The complete intermittent motion is derived from one cam only. Motion is imparted by the cam upon a shuttle at some point between the claws and shuttle pivot point, thus the cam design may be of short throw ratio. An experimental claw movement of this type, known to the author, having a vertical pulldown travel of 0.310 inches and a horizontal travel motion of 0.156 inches, has been in operation for a long period without noticeable wear in any of the two com-

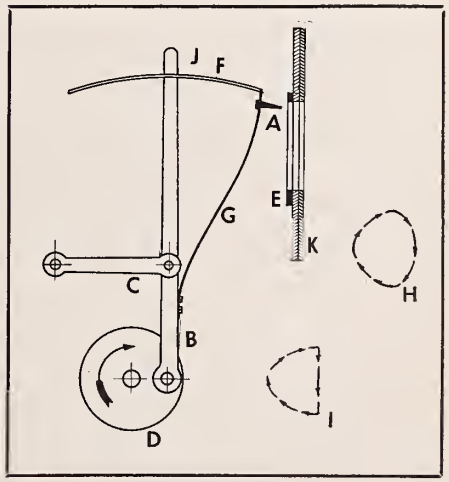


FIGURE 6

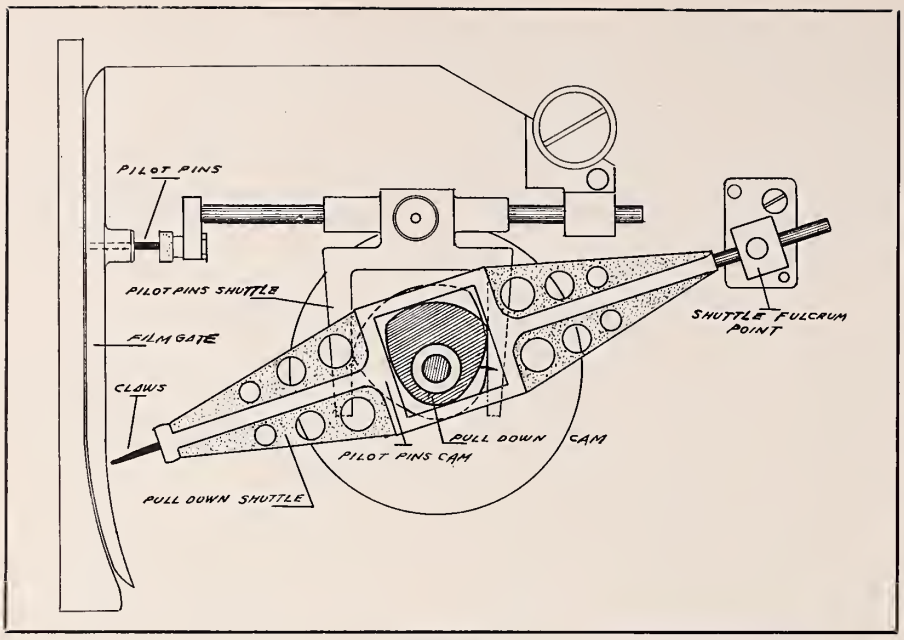


FIGURE 7

ponents in motion. This type of claw intermittent has also been employed widely in toy projectors as well as in many good semi-professional projectors in 8-, 9.5- and 16-mm sizes.

A clever and interesting claw intermittent mechanism is illustrated in Fig. 11. This claw movement has the advantage of self-adjustment design. The permanent adjustment between cam and shuttle faces is achieved by means of a curved tension spring as shown in the diagrammatic view of the mechanism. This tension spring not only holds the shuttle against the cam face, but also provides the horizontal motion of claws in entering and leaving the film perforations. Also, the spring action upon the shuttle serves as a shock absorber when the claws miss the film perforations due to bad splices, or a lost loop, etc. The shuttle is provided with a fiber inlay which makes the movement quiet and smooth in operation.

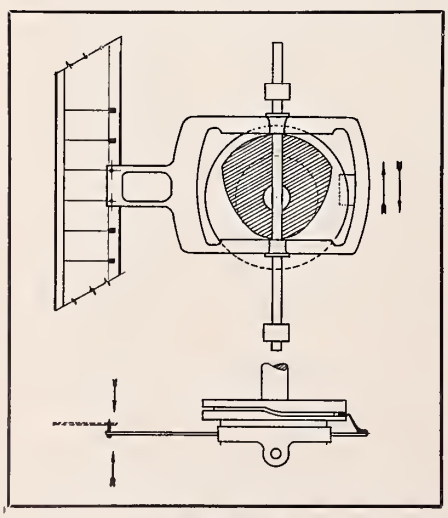


FIGURE 8

9 to 1 Intermittent Action

A very rapid claw intermittent movement is shown in Fig. 12. This mechanism has a high pulldown ratio. The effective ratio is 9 to 1, because the pulldown cam revolves at the rate of 48 revolutions per second or double the sound speed. The drunk cam, however, moves at 16 revolutions per second. In this movement there are two idle revolutions for the Lumiere cam to one revolution for the pulldown stroke, this action makes the pulldown cycle a 3 to 1 ratio. In Fig. 12A, may be seen the motor gear drive revolving at 2880 r. p. m. or 48 revolutions per second; B is the large gear wheel, and drunk cam C revolves at 960 r. p. m. or 16 r. p. s. The Lumiere cam (E) revolves at 2880 r. p. m. or 48 r. p. s. The working shuttle (F) moves up and down by means of a sliding shaft (G) in proper bearings now shown in the drawing. The vertical pulldown stroke is produced by the three-cornered or Lumiere cam every two revolutions of the cam shaft. The horizontal movement of claws is achieved on the same shuttle pivot point of the sliding shaft (G) and is activated by the drunk cam (C) as shown in the drawing. The shuttle completes the pulldown cycle during one-third of the Lumiere cam revolution, while the drunk cam permits the claws to engage the film perforations for every third stroke of shuttle vertical motion, thus, the pulldown ratio is practically 9 to 1.

All these very rapid intermittent motions having pull-downs from 6 to 1 up to 9 to 1 must impose a great strain on film perforations as compared with slower movements having pulldowns of 3 to 1 to 6 to 1 ratios. The single blade shutter (H) revolves at three times the frame speed and has, theoretically, a single blade of 120 degrees, but in practical design, the shutter is provided an occulting sector of 145 degrees and revolves at 48 revolutions per second for silent films, eliminating flicker. For sound speed film the shutter cycle frequency becomes 72 revolutions per second, producing a completely flickerless picture, even for the lightest scenes. These claw intermittent mechanisms, when properly designed and adjusted, are quiet in operation and precise in film registration.

One of the few unsolved problems in claw movements is the lubrication of parts in motion. The writer feels that there are some suitable materials for cam and shuttle construction such as hard fiber, nylon and other more modern materials developed for high speed components where lubrication is undesirable. A single cam intermittent as shown in Fig. 10 was built of hard fiber to match a duraluminum shuttle and after a long period of hard usage, the fiber cam only showed a total cam face wear of 0.0002 inches. Some types of lubricants are suitable for claw intermittents and the writer admits that there are types of claw intermittents permitting direct lubrication on the frictional parts in motion. However, there are other types of movements positioned so very close to the

(*Continued on page* 26)

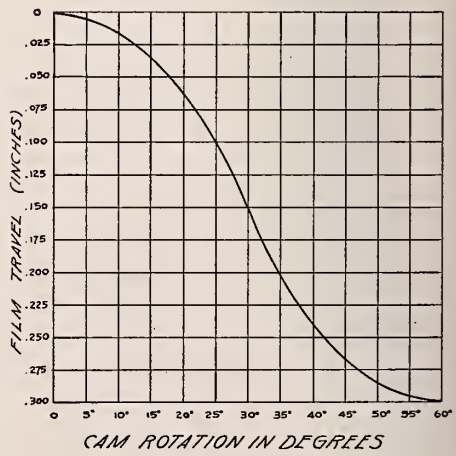


FIGURE 9

LETTERS TO THE EDITOR

Noise from License Patches

To the Editor of IP:

I am enclosing two pieces of film from two releases by Columbia Pictures. I can understand why a blank piece of film is put in before the license number—to protect the license in patching. But why do they use this type of stock? The framelines printed on this blank film extend all the way across the soundtrack area and cause loud noises when this section of film goes through the soundhead. Those responsible should be told that we have sound now and that the soundhead doesn't care what it reproduces. Can you think of a good reason for this type of stock?

In the December issue of IP I read the Monthly Chat with interest as I always do, and it reminded me that my manager received a questionnaire from Metro concerning our equipment. With information I had gathered from previous issues of IP concerning the 20th Century-Fox process of combined magnetic-optical prints, I know what the questionnaire was all about. It just proves one should read IP if he wants to keep up with the parade.

The thing to consider is this: if we install the magnetic sprockets, etc., one day we're likely to find in the projection room a magnetic-optical print, a Paramount VistaVision print, and cartoons on regular prints. Something tells me there wouldn't be any new trailers that day. Seriously, where there is a will there is always a way, and I hope they smooth out the wrinkles before they throw the new product at us projectionists.

James W. Morrison

New York City

Comment: The blank inserts for the New York State license-seal footage are printed on "lavender" duplicate-negative safety stock having camera-type perforations. Since the framelines on this blank film extend all the way across the picture and soundtrack areas, terrific 24-cycle motorboating will result when this film passes through the scanning beam of the sound head. Examination of these framelines reveals that they were produced by a standard silent-film camera aperture and printed through in a silent-film printer with no masking for the soundtrack.

Blank frameline-marked footage of this sort is used in processing laboratories for leader and tail-end strips to be attached to the regular release-print leader negatives. It is not absolutely necessary, but the operators of printing machines seem to like it. In fact, many reels of 16-mm prints for Tv showing have been spoiled by printers who threaded up on this sort of footage and ignored the sound-synchronizing start frames in the regular picture- and sound-negative leaders. Theatre motion pictures have happily been free for the most part from the inexpert laboratory and projection-room practices which have made much Tv film reproduction something of a joke.

Exchange managers should know better than to have film of this type spliced into theatre-release prints. Even apart from the motorboating, a dark screen looks like hell except at the beginning of fadeins and at the end of fadeouts.

This writer would simply cut out the offending footage and throw it into the shipping case from which interested exchange personnel can retrieve the worthless stuff. The projectionist is fully justified in doing this. If the exchange complains, the projectionist may well point out that such footage is unsuitable *and absolutely cannot be run through the projectors.* It is (1) negative-perforated film; (2) it produces loud motorboating noises, and (3) it causes blackouts on the screen.

After being removed, such film need not be respliced into the reel unless the exchange wants to pay for the time and effort involved in making eight unnecessary splices—four when the film is removed and four more when it is replaced. Neither the exhibitor's contract nor the laws of the State of New York make any mention of blank film that ruins the presentation.

Pen Mate Wanted

To the Editor of IP:

For some months now I have been receiving "International Projectionst," and I must say that I am more than pleased with it. In my opinion, it should be in every projection room. All of us down here are interested in your big indoor and drive-in theatres, and also in CinemaScope. Right now, anything to do with television is of great interest, as we will be seeing it here about next November.

I would like very much to correspond with a projectionist in the U. S., by letter and also on tape (I have built my own tape recorder). I have been in the theatre business for nearly 20 years, having begun when I was 12, which makes me almost 32 now. I work in a country show at East Maitland, 20 miles north of Newcastle, where there are three theatres, all equipped with CinemaScope, optical sound. My full line-up of equipment consists of Hamilton and Baker arcs, Westrex sound, and Simplex heads. I am also interested in amateur radio.

During the war, I served in the Islands and showed pictures to thousands of soldiers, many of them Americans, using De-Vry equipment. I am married now, and have two children.

I wish you the best of luck, and will be indeed pleased if you can help me.

Kevin J. Watson

6 Porter Avenue
East Maitland, N.S.W., Australia

Watch Out for Film Scratches

To the Editor of IP:

I read an article in the November issue of IP on the combined optical and magnetic print for CinemaScope film. This print will create a problem, I believe, because many of the magnetic prints we have been receiving here have been badly scratched (rain effects) due to the passage of this film through magnetic reproducers.

When this print is released, will theatres using CinemaScope optical sound then have to suffer with these rain scratches made in other theatres, or will some provision be made to overcome this problem?

I have been reading your publication for over two years and have obtained a great deal of information on technical questions. I plan to continue as a subscriber so long as you publish this fine magazine.

John F. Rodgers

Carleton Place, Ontario

Comment: We are advised by more than one reliable source that worn and badly-designed magnetic pickup heads are responsible for most of the fine rain-like scratches inflicted on magnetic track prints by penthouse reproducers.

Properly designed, a pickup head will contact only the magnetic tracks on the celluloid side of the film. Many such units, unfortunately, allow the picture area of the film to rub against the middle portion of the head simply because the track-contacting shoes, or pickup surfaces, have become worn down—or, as is sometimes the case, not made with sufficient height in the first place. The most we can do is replace the heads the moment the pick-up surfaces show signs of wearing flat. This safeguard may become necessary even before the sound goes sour.

The impedance rollers—the large "stabilizer rollers" positioned above and below the pickup head in most penthouse reproducers—can scratch the picture areas of the film only if they are plain cylinders that contact the entire surface of the film like the scanning drum of an optical soundhead. The impedance rollers of many penthouse reproducers are recessed, or cut down to a smaller diameter in the middle, so

(*Continued on page* 32)

In The SPOTLIGHT

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

WHEN an American producer without frozen foreign assets trots off to a foreign country to make a picture as uniquely American as the life of Daniel Boone, he obviously is doing it for one reason only: to escape paying recognized American standard of living wages. Such was the case recently when a Hollywood independent, Gannaway-Ver Halen Productions, Inc., filmed a feature titled "Daniel Boone" in its entirety in Mexico. No American technicians were along; non-union conditions prevailed.

The Hollywood AFL Film Council, which is composed of unions and guilds representing more than 24,000 employes in the movie industry on the West Coast, took quick action on the matter. A nationwise consumer boycott campaign was announced, although the picture has not yet been released.

The Film Council is calling on all national, state and local groups in the AFL-CIO to warn its 16 million members against the "runaway" film. Pledges of active support have already been received from the Kentucky State Federation of Labor and from many other key labor unions throughout the country. (Kentucky, it seems to us, would have been the proper locale for a picture dealing with the historic figure of Daniel Boone.)

George Flaherty, IA representative, stated that the wages avoided by the Mexican production were . . . "American standard of living wages which make possible attendance at our movie theatres. The Council recognizes that some pictures must be made in other countries in order to insure authentic foreign locale, but picture 'Daniel' is laid entirely in this country and should have been made here."

The IA is withholding the traditional emblem which for decades has flashed on the screen to signify movies made by American union workers.

• Gold engraved watches were awarded to eight members of Local 316, Miami, Fla., who have given 20 years or more service to Wometco Theatres, well-known theatre chain in Florida. The event took place at a recent dinner sponsored by the "Old Guard," a social club comprised of Wometco employes, and the presentations were made by Sidney Meyer, one of the co-owners of the theatre chain.

Recipients of the watches are Byron Huffstetler, T. C. Yearwood, Larkin Webb, C. E. Silvers, Ralph Day, Jack Shafter, Bonnard Leavitt, and Bill Arnold. Leavitt and Arnold were unable to be present at the dinner due to illness and death in their respective families.

In Memoriam

HARRY SHERMAN

March 3, 1952

MIAMI LOCAL 316 MEMBERS HONORED BY THEATRE CHAIN



Group photo taken at the recent dinner given in honor of the eight projectionists who were presented with gold watches by the Wometco circuit. Standing, left to right: Mr. and Mrs. Sidney Meyer, George Raywood, C. E. Silvers, Joe Campbell, Jack Shafer, Byron Huffstetler, Larkin Webb, T. C. Yearwood, Mr. and Mrs. Mitchell Wolfson, and Ralph Day. Seated in the same order are: Mrs. Raywood, Mrs. Campbell, Mrs. Shafer, Mrs. Hoffstetler, Mrs. Webb, Mrs. Yearwood, and Mrs. Day.

Joe Campbell, one of the Local 316 members at the dinner, received a similar award several years back.

George Raywood, business representative for 316, acting as spokesman for the gifted members, addressed the gathering expressing appreciation to the circuit heads, Sidney Meyer and Mitchell Wolfson, for their thoughtfulness and consideration.

• Leaders of the motion picture and television industries turned out en masse to attend the banquet in honor of IA President Richard F. Walsh at the Beverly Hilton Hotel in Los Angeles on January 31. The party culminated the mid-winter meeting of the General Executive Board which was held at the Hollywood-Roosevelt Hotel in Hollywood, and was sponsored by various West Coast studio Locals. Herbert Aller, Local 659; John Lehners, Local 776; James M. Crowe, Local 44; Albert K. Erickson, Local 727; and Alan Jackson, Local 683 were members of the committee in charge of arrangements.

On Friday, February 3, Los Angeles

LOCAL 150 HOSTS IA OFFICIALS



IA President Richard F. Walsh, honored guest at the recent testimonial dinner given by Los Angeles Local 150, is seen here flanked by two officers of the local: Clyde Shuey (left), business representative, now retired; and W. G. Crowley, president.

Local 150 gave a testimonial dinner in honor of President Walsh and members of the IA official family. The event took place at the Rodger Young Auditorium in L. A., and was attended by the membership of Local 150 and guests from nearby Local Unions. Clyde Shuey, the outgoing business representative for the L. A. Local, was master of ceremonies and, according to reports reaching this corner, he really did himself proud.

• Arthur E. Wick, member of Local 291, Grand Rapids, Mich., has been appointed Altec service representative for Western Michigan. He succeeds Ed Miller, of Detroit Local 199.

• The Illinois State Conference of IA Local Unions held a special meeting at the Hotel St. Nicholas, Springfield, Ill., on January 11 last, which was attended by 30 delegates from all sections of the State and by several IA representatives. This special meeting was called for the purpose of discussing the many problems confronting IA Locals in the State.

The executive board of the Conference later held meetings with the Illinois State Departments of Labor, Public Welfare, and Public Safety, and discussed the agreements under which IA men are employed in State institutions. Recent negotiations resulted in a 10% increase for these men.

Members of the board are W. F. Wepner, president, Springfield Local 323; O. H. Ingles, secretary-treasurer, Galesburg Local 166; Sam Lamasky, business representative, Chicago Local B-45; Frank Allen, business representative, Aurora Local 221; and Harry Condon, business representative, Local 434, Peoria-Pekin.

25-30 CLUB AWARDS



Acting on behalf of the 25-30 Club, Allen G. Smith (above, right), honorary member of the Club and New York City branch manager for National Theatre Supply, presents parchment scrolls of appreciation for their contributions to the art of projection to P. A. McGuire (top photo), retired ambassador of goodwill for International Projector Corp., and to Charles Muller (bottom), former chief projectionist at New York Radio City Music Hall.



Scholarships for Trade-Unionists

U. S. trade-unionists interested in studying at Ruskin College, Oxford, England, on one-year scholarships offered by the Transatlantic Foundation are invited to apply immediately to the Institute of International Education, 1 East 67th Street, New York 21.

Another scholarship is available at Coleg Harlech, Wales. Applicants generally should be between the ages of 20 and 35, should show promise of development as union leaders and should be qualified to study further in the area.

The scholarships cover tuition, room and board. Four U. S. trade-unionists are currently at Ruskin on scholarships donated by the British Trades Union Congress and Sir Robert Mayer, Transatlantic Foundation chairman, and one at Coleg Harlech on a scholarship given by the college.

AFL-CIO NEWS

• Failing all efforts to effect a settlement, Denver Local 230 has maintained a continuous picket line at the Evans Drive-In for the past 14 months.

• George Raaflaub, secretary of Syracuse Local 376, was honored by his Masonic Lodge—Sea & Field, No. 2-983, F&AM—at a dinner-dance recently held at the Masonic Temple in that city. Raaflaub had just completed his term as Master, and in commemoration was presented with a diamond-studded Past Master's ring.

• The Central Labor Union of Chattanooga, Tenn., is making an all-out drive to combat juvenile delinquency in that area and has appealed to labor for financial support. Among the first of the local unions to pledge assistance were IA Locals 259 (projectionists) and 140 (stage employes).

• George J. Schaffer, Los Angeles Local 150, was elected business representative, succeeding Clyde Shuey, who resigned from that office several weeks after his election last December. The December elections also resulted in a tie between Charles A. Vencil and H. Clay Blanchett for the 7th delegate to the forthcoming IA Convention. In a runoff Vencill won by a vote of 192 to 186.

• Sam Ellerington, member of Local 348, Vancouver, B. C., has undergone surgery for a long-standing ailment. We wish him a speedy recovery.

SURROUND VOLUME CHECK



Projectionists who have had difficulty monitoring the fourth track of a stereophonic sound system will be interested in the method devised by Don Littleton, of Local 760, Livingston, Montana. Don is pictured above in his projection room at the Ellen Theatre in Bozeman where he installed an ordinary AC voltmeter (indicated by the higher of two white arrows) across the output of the fourth track amplifier to give an instant visual check as to the amount of volume on this track at any given time. The lower arrow indicates the amplifier. With the additional help of the monitor speaker all guesswork is eliminated.

Heavy Fox Production Schedule

Twentieth Century-Fox has increased its 1956 production schedule to 34 pictures, four more than had been previously announced. An estimated $70,000,000 will go into making the pictures, declared Darryl F. Zanuck, vice-president in charge of production.

All 34 pictures will be produced either in 35-mm or the new 55-mm CinemaScope. How many of each there will be has not yet been determined. It is known, however, that both of Zanuck's personal productions, "The Man in the Gray Flannel Suit" and "Island in the Sun" will be photographed on 55-mm stock. Included in the proposed schedule are two Rodgers and Hammerstein musicals, nine Broadway stage hits, and 14 best-selling novels.

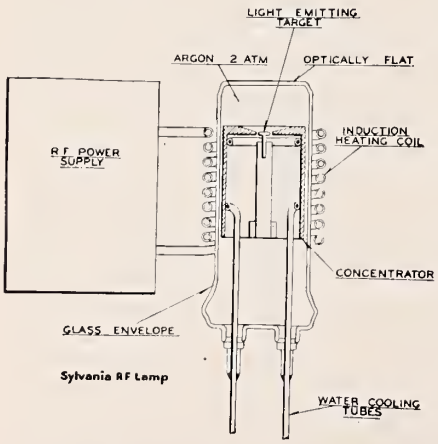
New Incandescent Lamps

One Sylvania design makes possible a more compact 16-mm projector; another provides a powerful light source for motion picture laboratories.

TWO NEW IDEAS in incandescent lighting for 16-mm projection and laboratory processing of motion picture film were brought forth last month by the same company, Sylvania Electric Products.

One development was a compact tungsten projection lamp, much smaller than those now available and designed to burn horizontally and top down as well as in the standard position. According to Sylvania, this new lamp will make it possible for 16-mm and 8-mm projection manufacturers to design equipment in radically new and compact shapes.

The other development was the RF lamp, a completely new and powerful incandescent light source which is designed more for the needs of motion picture processing laboratory than for projection, although it may eventually be used for the latter purpose also. The RF lamp emits a powerful concentrated beam without direct connection to electrical power. Current is transformed into high-frequency radio waves which, through an induction coil wound around the lamp, act upon a small carbide disc inside the lamp, bringing it to white heat.



The working principles of the Rodio Frequency lamp developed by Sylvania ore clarified by the above diagram. Powered by radio frequency woves generated in the power supply, the tiny carbide disc in the center of the lamp, identified as the light-emitting target, is heoted white hot without ony direct connection to the power source. Energy is tronsferred through the induction heating coil thot winds around the lamp.

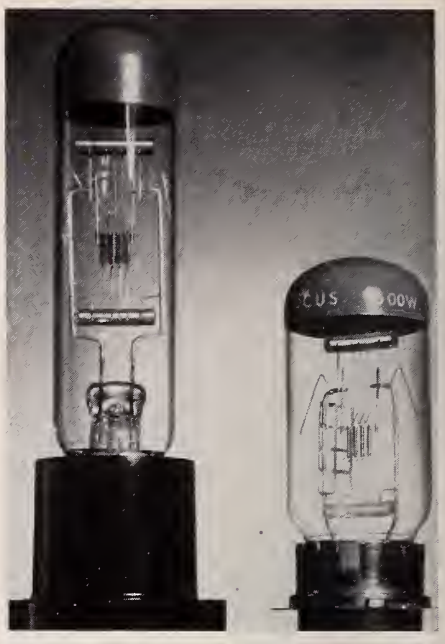
In demonstrating the first projection lamp to a group of projector manufacturers at the Waldorf-Astoria Hotel in New York, Sylvania also exhibited hand-tooled models of the casings or enclosures for compact projectors of radical design. The casings resembled those of small portable radios, were only about 3 inches high, and could be carried like a purse. No separate carrying case was needed. A projector of this size and shape can be designed around the lamp because it is smaller, and because it will burn horizontally or vertically. The lamp is only 4 inches high including its base compared with the standard height of over 6 inches. It is expected that it will be manufactured in all sizes up to 1000 watts.

Locked Optical Alignment

This compact tungsten lamp, which will be sold under the trade name of Tru-Focus, is claimed by Sylvania to have an additional advantage over standard types: its filament is locked into permanent optical alignment with the projection system. The relationship between the lamp and a special socket eliminates need for any adjustment.

To assure that the lamp is positioned with absolute acuracy, a key is built into the base. This key is inserted into a slot in the lamp's socket, locking the lamp into exact position. Metal "fingers" around the socket hold the lamp securely regardless of burning position, and guard against its shaking loose under vibration.

The ability of the Tru-Focus lamp to burn horizontally is basically the feature that makes it possible to design new projectors around it. It can burn that way without blackening or blistering its glass envelop because a special grid directs air flow inside the lamp. The grid collects a large part of the lamp-blackening particles which form when any projection lamp burns. By keeping the glass clearer, this grid is claimed to maintain the lamp's lumen output at a high level for a longer time than has been possible up to now.



The new Tru-Focus tungsten projection lamp developed by Sylvonia is shown at right beside a standard lamp with both lomps set in their bases. The standord lomp ond bose is neorly 6½ inches high while the Tru-Focus unit, including base, is only four inches in height. In addition, the new lomp may be burned horizontally or top down. A grid, which can be seen behind the flament of the Tru-Focus lomp and slightly to left, gathers particles emitted by the filament during burning ond controls the flow of heat inside the lamp so thot it may safely be burned horizontally.

It is predicted that several projector manufacturers will have equipment on the market by the Fall embodying the new design concepts made possible by this Sylvania lamp. The first projectors utilizing the new design will probably be slide projectors, but midget units for both 16-mm and 8-mm projection may appear on the market within the next year or two. The new design lends itself well to projectors for use in the home and by salesmen who need an extremely compact and portable unit for describing products and services to small audiences.

The other new lamp announced by Sylvania, the RF or radio frequency lamp, was developed in cooperation with the Motion Picture Research Council. It is now being used as a light source by motion picture laboratory printers. It may soon be adapted to the lighting of sets and the projection of 16-mm motion picture film.

In the RF lamp the same type of radio signal that transmits sound to radio and Tv receivers is used to heat a tiny disk or tantalum carbide, a material that will withstand unusually

high temperatures. Because this substance can be heated to a much higher temperature than the tungsten filaments in conventional lamps, a much brighter and whiter light can be obtained. The choice of inductance, rather than direct electrical connection was necessary because of the difficulty of working the high-temperature carbide into wire.

The disc formation of the carbide, as contrasted with the usual tungsten wire filament, provides a more uniform light and serves the additional purpose of focusing the light directly without complicated optics.

The radio frequency energy, inductel by means of a copper coil wound around the outside of the lamp, is concentrated on the small carbide disc, which is only 5/16 inch in diameter. Because of the high temperature capacity of the disc, the resulting light has a higher content of blue than does the incandescent lamp and provides more light emission in the visible and ultraviolet range.

The chief advantages of the RF lamp are its brightness and uniformity of light. Tests were made to compare the effectiveness of the new lamp and a 1000-watt incandescent lamp designed for 16-mm projection. It was found that the RF lamp gave a light intensity reading of 500 foot candles at a distance of two feet, at a color temperature of 3700 degrees Kelvin. In addition, 1800 screen lumens were obtained as compared to 800 when using the 1000-watt bi-plane projection lamp. However, an RF projection lamp for 16-mm use would be a great deal more complicated and expensive than the usual tungsten source.

Uniform Light Source

The RF lamp provides a concentrated as well as uniform source of light, so concentrated that nearly all the light produced by the lamp is usable. Because the carbide disc emits light uniformly, it can be focused directly on the film gate of a projector, eliminating all diffusion without impairing the uniformity of illumination. Such an optical arrangement avoids the loss of light that occurs when a light source is not focused directly on the film plane. Some defocusing is necessary to assure uniform illumination of the film gate when a non-uniformly emitting light source is employed.

It should be pointed out that the RF lamp is potentially usuable only in 16-mm projectors. In its present form, it could not serve satisfactorily in 35-mm theatre projectors. Chris Peek, of Sylvania's research department, who developed the new lamp, admitted: "We have quite a way to go before we can beat the carbon arc."

The first to take advantage of the RF lamp have been the motion picture film printing laboratories, for which it was chiefly intended. The time factor in the printing process has long been a prime concern to studios. All too often, an expensive and important release would be tied up in the labs pending the reproduction of sufficient copies for adequate distribution. It was with this in mind that the Motion Picture Research Council asked Sylvania to develop an improved light source for laboratory printers. Through the use of the brighter RF lamp, laboratories can now increase the speed of film printing operations by as many as eight times.

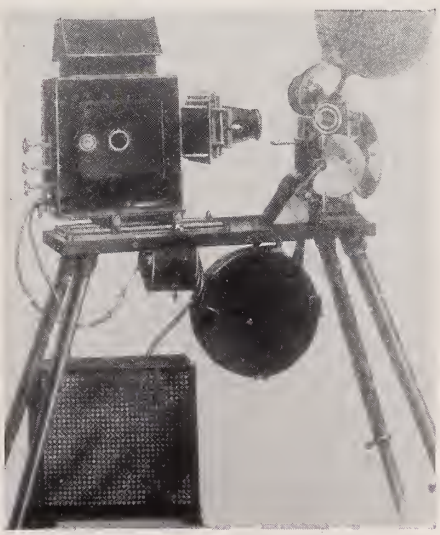
The maximum overall length of the lamp is 9 5/8 inches. It is fed by a two-unit power supply, high voltage direct current starting in one unit then converted into high-frequency alternating current by a second unit, a radio frequency generator. The high frequency radio waves are transferred into an induction coil which fits around the lamp and which passes the waves through the lamp's glass envelop.

The waves then couple into the lamp concentrator. A target rod holds the metallic carbide target in the center of the radio frequency field. RF current heats the target disc to a high temperature, causing the disc to emit a uniform brilliant light. Up to 4000 degrees Kelvin color temperature can be obtained. Water cooling tubes provide a constant cool flow to keep the concentrator from overheating.

Ray Brian's "Movieana" Archives

HERE WE GO again with another installment, the eighth, of Ray Brian's seemingly inexhaustible collection of data on motion picture projectors. Ray Brian, veteran projectionist and member of Local 434, Peoria, Ill., has devoted years to gathering all available information pertaining to projection equipment.

IP feels that Brian's is a noteworthy contribution and should be of interest to projectionists the world over. Anyone anywhere with any additional information is invited to contact Brian through the offices of IP. Photographs especially will be appreciated. In the listing that follows, an asterisk indicates that photos of the particular equipment are not part of the collection. Brian's vast files, on the other hand, contain many different photographs of the other items named.



Pathe professional model—about 1910.

NATIONAL—National Projector Co., New York City.*
NEK—made in Japan, 1953.
NEUMANN—made about 1900.*
NEW BIO—made in England, 1912.
NEW CENTURY—made in England by the Kalee Co., 1910.
NEW STAR—made in Japan, 1930.
NEWTON—made before 1900.*
NICHIDEN—made in Japan, 1950.
NISSEY—made in Hiroshima, Japan, by Nissey Projector Co., 1954
NITSCHE—made in Germany, 1910.
OMNIGRAPH—*
OPTICA—made in Germany about 1914.
OPTIGRAPH—Alva Roebuck and Frank McMillan, 1898.
OSSA—made in Spain, 1952.
PALMER—made in England by Geo. Palmer.
PALMER—made in U. S. by Frederick E. Baldwin, 1911.*
PANTOBIOGRAPH—made about 1900.*
PANTOMIMIOGRAPH — made about 1900.*
PANTOPTIKIN—Latham's first machine, 1895.
PANORAMOGRAPH—made about 1900.*
PATHE—Chas. Pathe, made in France, 1898.
PATHESCOPE—American Pathe Co., 28-mm, 1920.
PECO—made in Australia before 1920.*
PEERLESCOPE—Nicholas Power, 1902.
PEERLESS—Geo. A. Knaak Co., 1908.
PEERLESS—portable, made about 1920.
PERFECTION—made by Baxter in 1900.*

What Do You Know About Carbons?

The sixth and final of a series of questions and answers which explain the unique nature of carbon and describe how the substance is utilized so as to provide the brightest of all artificial light sources. Data presented here provided by National Carbon Company.

Why is magnetic flux needed to stabilize an arc?

It is an established fact that every conductor carrying an electric current is surrounded by a magnetic field which is generated by the current. Fig. 1 illustrates the magnetic field which surrounds the carbons and the arc in a condenser type high intensity lamp. Because of the angular position of the carbons in these lamps the magnetic lines of force generated by the current are crowded below the arc and are less dense above the arc. The resultant effect of this combination of magnetic lines is a force upward (indicated by the arrow) which, in conjunction with the natural flow of the arc stream, projects the tail flame of the arc in an upward and forward direction from the positive crater.

In the simplified high intensity type lamps where both carbons are held in a horizontal position the magnetic lines of force are distributed uniformly around the carbons and there is no concentration of magnetic flux beneath the arc such as that which occurs when the negative carbon is inclined to the positive as in Fig. 1. Consequently there is no magnetic force in any direction influencing the position of the arc stream. Operated under these conditions the tail flame surrounds the arc in almost a uniform layer.

To obtain an efficient high intensity effect from these arcs, they are equipped with an auxiliary magnet. The magnetic flux from this auxiliary source is illustrated diagrammatically in Fig. 2, and is of such direction as to supply the required upward force on the arc stream thereby causing the tail flame to be lengthened and driven upward. Under these conditions the tail flame becomes comparatively stationary and constant in both length and direction.

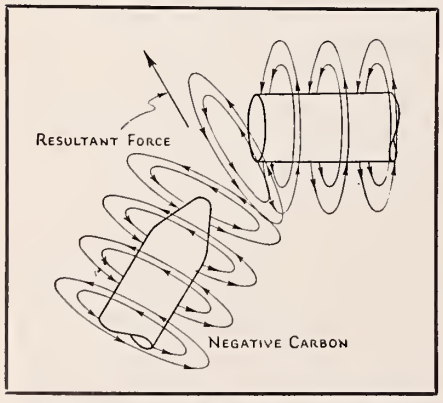


FIG. 1. Distribution of the magnetic flux about the carbons set at any angle less than 180 degrees.

The axis of the negative carbon is placed slightly below that of the positive to compensate for the angular direction of the arc stream and to maintain a well formed crater on the positive carbon. If the supplementary magnet is too weak the arc will go in and out of the high intensity effect, causing current fluctuations which result in very unstable screen light.

How can carbons be used most efficiently?

It is highly important that the correct type and combination of carbons be used. Projector carbons are manufactured to meet the specific requirements of a certain type of lamp and the combinations recommended have been carefully determined by laboratory and service tests. Highest light-producing efficiency is obtained when carbons are operated at or just below the maximum current recommended by the manufacturer.

Where should carbons be stored?

Carbons should always be stored in a dry place. They are porous and will absorb moisture if stored in a damp location, with the result that sputtering or flashing at the arc will be experienced. "National" projector carbons are thoroughly dry when they leave the factory but there is always the possibility of exposure to dampness during shipment or storage. For this reason, the practice of some projectionists of laying a few carbons in the lamp house or on the top of a rheostat before burning is to be commended. Carbons are not perishable. A damp carbon, after being thoroughly dried, is as good as ever.

What Happens when an arc is struck?

All "National" High Intensity projector carbons are pre-cratered to reduce the amount of time necessary to burn in the crater of a new carbon; however, when burning in a new carbon sufficient time should be allowed to form a good crater of proper depth before the changeover is made.

When an arc is struck the positive crater is subjected to both thermal and mechanical shock, particularly if the arc is struck at full current. Occasionally this shock causes the lip of the crater to be cracked or a chip broken away so that the burn-in period is increased by the time necessary to form a symmetrical crater. This will occur more frequently when contact is made on the lip of the crater.

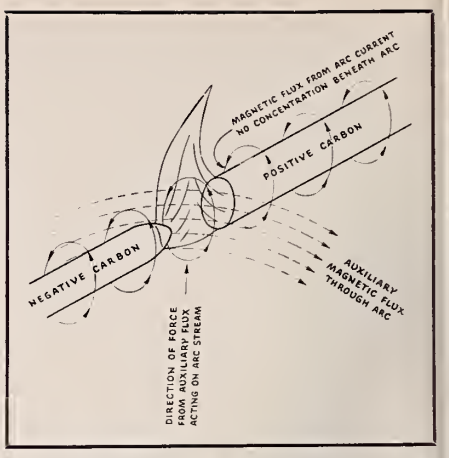


FIG. 2. Distribution of magnetic flux from auxiliary magnet.

The ballast resistance should be wired so that the operating current after striking is about one-third full load. The current is promptly boosted to normal after the arc is struck. A step-up switch having three terminals is available for this purpose.

Projector Exports Rise

Exports of motion picture films and equipment in 1955 reached an all-time high of $43,835,049, a gain of about 12% over similar exports in 1954, according to the U. S. Department of Commerce.

Total exports of all types of motion picture equipment, including cameras, projection equipment, sound apparatus, and studio equipment during 1955 were valued at $14,923,726, a slight increase over the previous year's figure of $14,470,800. While there were declines registered in exports of motion picture screens and sound reproducing equipment, these were offset by increased exports of 16-mm and 35-mm motion picture projectors, cameras, arc lamps, sound recording, and studio equipment.

Bodde Cuts Screen Price

A reduced price of $1.85 per square foot is now in effect for all screens manufactured by the Bodde Screen Co., Los Angeles. The aluminized-surface seamless screens manufactured by Bodde can be obtained in six different reflective surfaces to fill the needs of theatres of any size or design. A white matte screen is available in three reflective surfaces. The screens are washable with vegetable soap and water.

PERSONAL NOTES

AUGUST F. SCHOENFIELD, JR. has been appointed field service engineer for Ampex Corp.'s Instrumentation Division, New York and Washington districts. Formerly associated with Audio-Video Products, New York, and Raymond Rosen Engineering Products, Philadelphia, Mr. Schoenfield worked on the development, design and manufacture of an instrumentation recorder and a magnetic tape compensation system. He also assisted in the installation of telemetering ground station equipment at AFMTC, Patrick Air Force Base, Cocoa, Fla.

* * *

DR. AXEL G. JENSEN, engineering vice-president of the Society of Motion Picture and Television Engineers, has been nominated as a director of the American Standards Association for a three year term commencing Jan. 1, 1956. Dr. Jensen's name will be submitted for approval by letter ballot to the member organizations of the ASA.

* * *

S. L. THOMAS has been named sales manager of the newly established New York District of General Precision Laboratory, Inc., Pleasantville, N. Y. Heading GPL's new Mid-Atlantic District, covering eastern Pennsylvania and southern New Jersey, will be J. E. MULLEN, formerly eastern sales manager for Dage Television Division of Thompson Products. Both moves are part of a stepped-up program in the industrial Tv field by GPL.

* * *

DR. LEROY M. DEARING was appointed technical director of Technicolor's newly created amateur color processing division. Dearing joined Technicolor in 1946 and served recently as director of research. His previous associations were with Eastman Kodak, where he was technical supervisor of amateur processing, and the Navy Department, as head of photographic research.

British Equipment Show

The Kinematograph Manufacturers' Association and the Cinematograph Exhibitors' Association of Great Britain will both participate in a large equipment trade show at Blackpool (England) beginning May 28th.

New Technicolor Service

The facilities of the Technicolor Corp. will be available to amateurs for the processing of 35-mm Kodachrome film under a policy scheduled to go into effect in May.



. . . the SUPER SNAPLITE LENS for the clearest, sharpest, brightest pictures you have ever seen on your screen!

Your patrons will notice the difference — Super Snaplite gives greater contrast, better definition, more light on the screen where it really counts.

Ask your dealer for Bulletin 222.

KOLLMORGEN Optical CORPORATION

Plant: Northampton, Massachusetts
New York Office: 30 Church Street, New York 7, N. Y.

CLAW INTERMITTENT

(*Continued from page* 18)

film plane that lubrication is obviously undesirable.

The old dispute about claw movements *vs.* geneva intermittents is meaningless. For many years the claw in-

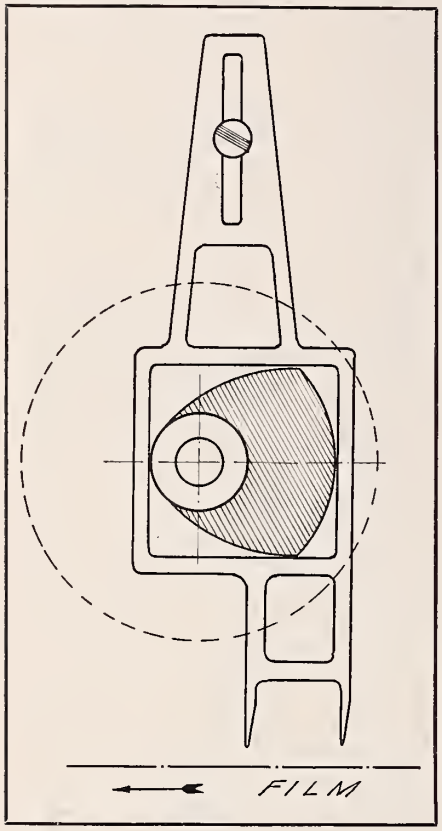


FIGURE 10

termittent movement has been considered with prejudice when compared with the geneva movement because the claw is less robust and has been the standard intermittent in toy and low-priced machines. The intermittent mechanisms of the geneva type** , it is true, are precision devices with many technical refinements compared with the claw intermittents. The claw mechanism, however, is a natural registering or indexing precision mechanism. All the intermittent action can be derived from only two parts in motion—the cam and the shuttle. The motion of claw mechanisms is always a truly continuous circular movement, the indexing or registration action always remains constant for every revolution of the cam shaft, and every picture frame remains registered by the constant cam position relative to the film gate aperture opening. This is the main advantage of the claw movement.

With the geneva intermittent movement, because of its multiple slots or indexing stations, there is always the possibility of bad registration from frame-to-frame in the film gate aperture. The high degree of registration stability of the claw movement makes it one of the most reliable and precise mechanisms for substandard, or 16-mm, projector design.

A problem inherent in claw intermittents is the abrasive action of the film base upon the claw face. At present many claw intermittents employ special steel alloys in the claw tips, but after a long period of service, appreciable wear is developed to a degree that prevents exact film registration, thereby causing film damage, vibrations, and high operational noises. Many methods of avoiding excessive wear of claw tips have been tried. One of the most successful has been the use of very hard carbide alloys and sapphire inserts, but the problem of wear in the claw contact areas remains

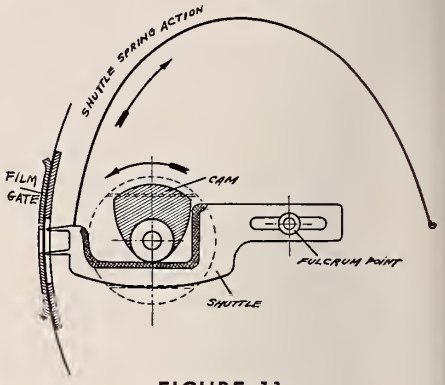
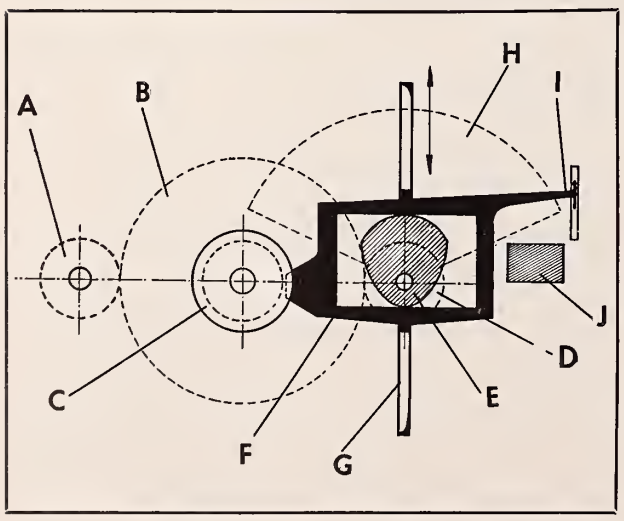


FIGURE 11

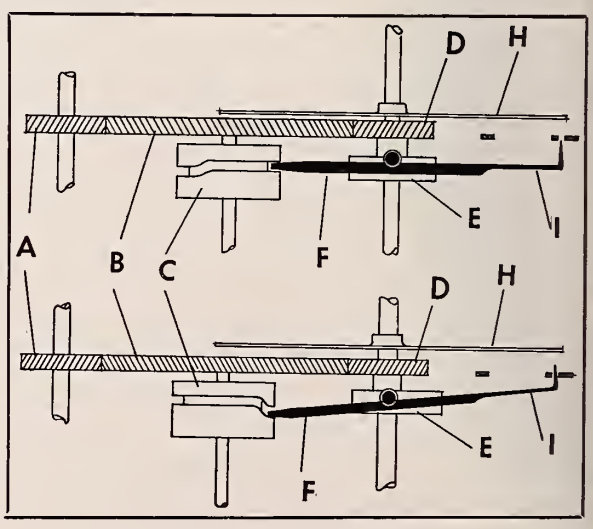
unsolved. This is true, at least when the claw intermittent is compared with the 35-mm professional mechanism. The advantage of geneva intermittent mechanisms for heavy and continuous duty in the theatre is evident and backed by many years of practical experience.

Picture frame stability is an important factor in designing a claw intermittent. So is the film gate design and construction. Both factors can be the source of many troubles and inaccuracies of film registration, film damage, vertical and horizontal instability, etc. The claw mechanism should move the film downward the same distance, 0.300 inch, frame after frame, with each successive cycle of cam rotation without tearing the perforations and with exact frame registration in front

** Tv film projectors are usually described as operating at a speed of 30 frames per second in contrast to the 24-frames-per-second speed of theatre projection, but this statement can be misleading because the film actually travels at the same speed in both types of projection. The difference is only in the number of shutter cut-off periods. In theatre projection there are 48 periods of light on the screen each second—twice 24 when you consider the action of the flicker blade. However, to synchronize projector to the requirements of the electronic Tv camera system, there must be 60 periods of light on the screen each second. This is usually accomplished through the use of a projector with an extremely fast pulldown action so that there can be three rather than two periods of light for every other frame.



(Left)
FIGURE 12



(Right)
FIGURE 12a

of the aperature rectangle. All the components in motion should be well balanced to eliminate vibration and noises. The shuttle body should be of one rigid and light substance with good wearing properties. The claw tips should be designed with the correct shape to enter the film perforations without shock. The vertical stroke or pulldown action must be vertical with accelerated and decelerated motion. The claws must leave the perforations with horizontal motion and without jarring the film in any way.

Lubrication

The claw movement should be capable of long use without frequent lubrication. This latter condition is variable according to the type and design of the claw movement. Some claw intermittents are designed in a way that the shuttle and cam components are far away from the claw tips and film plane, so good lubrication can be secured without any risk of film damage. However, others are so close to the film plane, as previously mentioned, that lubrication becomes practically impossible.

In the claw intermittent mechanism, the film gate plays an important part due to the stopping action during the projection cycle. The tension placed on the film by pads should be sufficient to hold the film flat during the projection time but must be weak enough to let the claws pull the film without jerks and excessive tension. The abrasion of film base over the film gate tracks is overcome by using very hard stainless steel pads and heavy chromium alloy plating. Some modern projectors employ sapphire inserts in the lateral guides of film gates. Jumping and weaving of the image when magnified occurs occasionally even in high priced machines. The claw intermittent and film gate design, when carefully designed and constructed, should not allow movement in excess of 3/16 inch vertically or laterally at 120 times magnification.

Framing Methods

One of the features to bear in mind when claw intermittent mechanisms are designed, is the matter of framing the picture image on the screen. In some cases, framing is accomplished by moving the whole mechanism in a vertical path parallel to the film plane. This method is known as theatrical framing and is a must in television projection

"PRIME-UP" right for NEW PROFITS from the great NEW FILMS



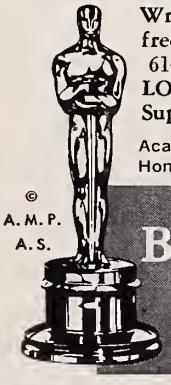
Bausch & Lomb
SUPER CINEPHOR
Projection Lenses

New film techniques, in the great new pictures now being released, put new depth and clarity on the print. Make sure your prime lens can transmit all this new brilliance, color and vivid detail onto your screen. More than ever, these great movie advances are bringing customers out of the home and into the theatres again. Assure profitable *repeat* patronage with B&L Super Cinephor Lenses . . . for today's most thrillingly vivid screen images of all 35mm releases.

SEE THE BIG DIFFERENCE . . . FREE DEMONSTRATION!

Write, wire or phone for Catalog E-123 and for free demonstration. Bausch & Lomb Optical Co., 61603 St. Paul St., Rochester 2, N. Y. Phone: LOcust 3000. (In Canada, General Theatre Supply Co., Ltd., Toronto.)

Academy of Motion Picture Arts and Sciences
Honorary Award for Optical Service to the Industry



© A. M. P. A. S.

BAUSCH & LOMB
SINCE 1853

as well as in the motion picture theatre.

The more usual practice in 16-mm projector design, is to move the aperture plate vertically while the film remains in the same position, but this method displaces the projected image on the screen. The method of moving the projection lens and aperture plate is also employed in some projectors. The first method of theatrical framing is efficient, but it makes the intermittent mechanism more complex from the point of view of mechanical design and practical construction. However, theatrical framing is necessary in television projector design as well as in theatre projection where the projected image is ruled by the fixed dimensions of screen or camera tube mosaic.

In Tv projection practice, the claw intermittent has been used more extensively than geneva intermittents, although at present it seems that geneva movements and optical intermittents (in continuous-motion projectors) are displacing the conventional rapid claw mechanisms. A fact that made the claw intermittent the choice for Tv projectors was the advantage of the 5 to 1 ratio of pulldown that could be obtained from 16-mm projectors already on the market.

In addition, many new projector designs have been recently developed for Tv. These designs make possible more efficient starting and stopping of the machines, quick changes of projection and exciter lamps, automatic threading, theatrical framing and other conveniences to meet the needs of Tv projection practice. A good example of Tv projector design is the RCA TP-6A 16-mm television projector employing a claw intermittent with sapphire inserts. This movement is of double cam face revolving at 720 r.p.m., with two pulldown strokes for every cycle of the intermittent shaft, resulting in 24 frames per second with low rotational speed instead of the conventional 1440 r.p.m. cam shaft speed.

Many ultra-rapid designs of elaw intermittents have been developed to attain very short pulldown times. These intermittents are of the "hermaphrodite" design, half geneva and half claw. The source or first intermittent stage of motion is by means of a geneva motion of special design geared to one claw intermittent mechanism of rapid motion stroke. The claw intermittent mechanism is actuated by the discontinuous motion of the geneva mechanism on the claw intermittent pulldown cycle. Thus, the geneva motion, not used in the conventional way, does the work of a mechanical accelerator or speed multiplier. The pulldown obtained on the claws is within 7 degrees and near 1250 micro-seconds of pulldown duration time. Figure 13 is a diagrammatic arrangement of one of these hermaphrodite intermittents.

A Place for Both

The preference of geneva mechanisms over claw mechanisms or *vice-versa*, is ruled by the circumstances of design and operation. The geneva family of intermittent mechanisms for theatre projection have many advantages over the claw mechanism, and for 16-mm use they have, perhaps, some disadvantages. But no other intermittent device can surpass the geneva movement in terms of useful life and continuous duty service, year after year, in the theatre.

The claw intermittent mechanism is far less robust than the geneva movement. Nevertheless, for general substandard (16-mm) use in the school, church, or home, where the projector is run only at intervals and not continuously as in the case of the theatre projector, the claw intermittent mechanism, if designed close to the ideal pulldown action, will give many years of satisfactory service at relative low cost. The writer has had much experience with claw intermittent projectors, including design and construction, and the comments contained in this article are made on the basis of this experience.

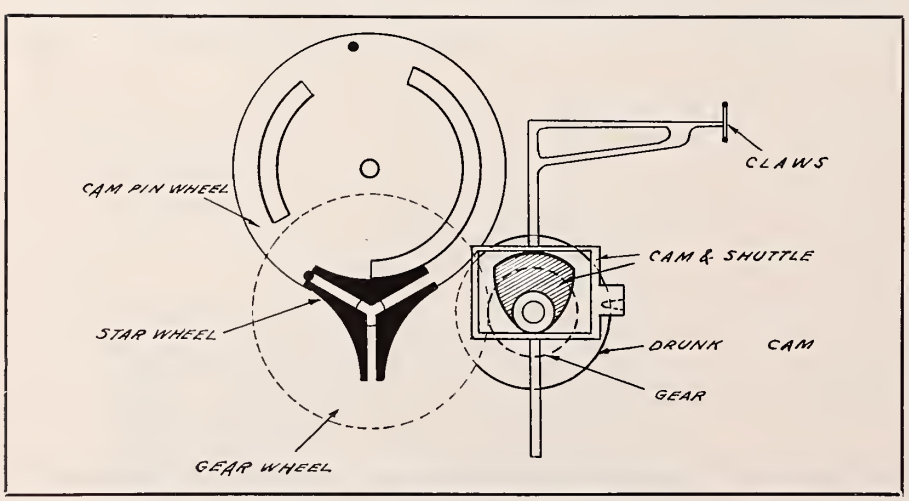


FIGURE 13

BOOK REVIEW

THE MASTER GUIDE TO THEATRE MAINTENANCE, by Aaron Nadell. 130-57 Lefferts Blvd., South Ozone Park. Long Island, N. Y., 240 *pages*, $5.

On the title-page of this handy volume can be found the following description of its contents: "A Comprehensive Guide to the Selection and Use of Methods, Devices and Supplies for Attracting, Selling and Entertaining Patrons, and for Keeping the Theatre Comfortable, Sanitary and Appealing to the Eye." Actually the book is more than that, containing some highly informative sections on projection, acoustics, heating, air conditioning, drive-in operation, as well as an interesting discussion on negligence in relation to theatres.

Although this "Master Guide" is primarily designed for theatre managers, it can profitably be read by projectionists and other theatre technicians; in fact, anyone at all connected with the exhibition end of the business. What it offers is a survey of smooth theatre operation, including numerous valuable recommendations for proper maintenance of all types of theatre equipment.

The chapters on projection are necessarily untechnical. "*The manager cannot be expected to be a projectionist, himself,*" the author declares, and then goes on to give a clear-cut definitive outline of what good motion picture projection consists of.

In other hands, this venture could easily seem presumptuous. Aaron Nadell, however, with 25 years of varied experience in the motion picture field and a former editor of IP, is more than well qualified. It is to his credit, moreover, that he has not tried to pack into this book the whole store of his technical knowledge, but rather has carefully selected and sifted and come up with the right level of data for his intended readers.

OBITUARIES

ECKERSON, THEODORE H., 66, member of Los Angeles Local 150, succumbed to a fatal heart attack on February 7. A member of Local 150 since January 26, 1915, Eckerson served several terms as business representative. He was active in labor circles having served as executive secretary for the Los Angeles Amusement Federation, and for many years was delegate to the Central Labor Council. For the last 18 years he worked as projectionist at the downtown Paramount Theatre in Los Angeles.

• • •

JACKSON, HOWARD H., 65, Local 343, Omaha, Nebr., died suddenly on January 31, less than three weeks after his re-election as business representative for his 23rd term. He was well known in IA circles, having represented the Omaha Local at IA Conventions for many years.

• • •

STURDEVANT, RALPH, 66, longtime member and former official of Local 230, Denver, Colo., died recently after a lingering illness. A member of the Local since 1918, Sturdevant held various offices. Illness forced his retirement about two years ago, but he maintained an active interest in union affairs almost until the day of his death. Although he walked with great difficulty, often relying upon crutches, Sturdevant represented Local 230 at the October 1955 meeting of the Colorado Federation of Labor.

Survivors are his wife, a son, a daughter, and two grandchildren.

• • •

PENNEY, WALTER J., 65, member of Local 552, St. Petersburg, Fla., died recently following surgery at a local hospital.

• • •

CECIL L. NEES, 81, charter member of Local 228, Toledo, Ohio, died recently. Born in Colton, Ohio, he made Toledo his home for the last 55 years. Nees worked as projectionist at the Pantheon Theatre in that city for the last 14 years. He was a member of the Bay View and Ottawa River Yacht Clubs. Survivors are his wife and two daughters.

• • •

WALTER RAYMOND TINNEY, SR., 58, member of Local 407, San Antonio, Texas for the past 34 years and projectionist at the Texas Theatre there died suddenly. He was also a member of Local 678, Laredo, Texas, and at the time of his death was business representative for the Laredo Local. Tinney was a veteran of World War I and a member of Knights of Columbus, San Antonio Council 786. He is survived by a son, W. Raymond, Jr., a member of the San Antonio Local.

• • •

JOHN W. SAWYER, 69, member of Buffalo Local 233, succumbed to a lingering illness. He was chief projectionist for the Stanley Warner Cinerama Corp. in Buffalo, having transferred to that organization last March. Prior to his transfer he was supervisor of projection for 16 theatres in the Shea circuit. He was a member of the 25-30 Club of New York and an associate member of the SMPTE. His wife and a son, Donald E., survive him.

• • •

L. DEAN SMITH, 58, charter member of Local 621, Erie, Penna., died recently at the Hamot Hospital in that city. He had been troubled with a heart ailment for quite some time. He worked in the projection room of the Strand Theatre for 14 years, transferring to the Warner Theatre when it opened some years ago, where he worked until the time of his death. Smith was active in civic affairs, serving as secretary to the Erie Lion's Club for many years. He is survived by his wife and daughter.

BUY U. S. SAVINGS BONDS

I A ELECTIONS

LOCAL 291, GRAND RAPIDS, MICH.

C. R. Bright, *pres.;* A. J. Prus, *1st vice-pres.;* E. E. Van Horn, *2nd vice-pres.;* W. J. Sowa, *3rd vice-pres.;* C. M. Breas, *sec.-treas.;* H. J. Ringold, *rec.-sec.;* J. O. Bogardus, *bus. rep.;* E. O. White, F. F. Greenfield, Stanley Kant, *trustees;* Del Landon, Norm Proctor, Willie Cowles, *exam. board.*

LOCAL 376, SYRACUSE, N. Y.

Louis R. Boyd, Sr., *pres.;* Melvin A. Denny, *vice-pres.;* George F. Raaflaub, *sec.;* Lionel B. Wilcox, *fin. sec.-treas.;* Walter M. Scarfe, *bus. rep.;* Louis R. Boyd, Jr., *sgt.-at-arms;* Leonard H. Tondeur, Charles R. Nelson, George E. Doss, *trustees;* Warren E. Williams, Adolph DenHaese, *exec. board;* Philip T. Rossomando, *del. Central Body.*

LOCAL 712, OWENSBORO-HENDERSON, KY.

William Drury, *pres.;* Norman Brown, *vice-pres.;* Earl Hardin, *sec.;* William Stewart, *treas.;* William Cart, *bus. rep.;* W. Cart, *del. IA Convention;* W. Cart, N. Brown, *del. Central Labor Union.*

INTERNATIONAL PROJECTION SOCIETY, TORONTO CHAPTER

H. N. "Doc" Elliott, *pres.;* Bill Hills, *vice-pres.;* John Jeffrey, *sec.;* Bob Milligan, *treas.;* Lou Lodge, A. Milligan, *technical advisors;* P. Cox, F. Cross, Jr., *film;* G. Hulse, G. Rands, *mechanism,* H. Brooks, M. Killem, *sound.*



Your doorman may be a dream...



Your usherettes may be starlets...



BUT EVERY PERFORMANCE STILL MUST BE PERFECT!

For a perfect performance, vital operating equipment has to work without a single slip. The best man to keep it exactly that way is an expert RCA Theatre Service Engineer. He's the *only* man who brings to your house the full backing of RCA's technical resources.

RCA SERVICE COMPANY, INC.

A Radio Corporation of America Subsidiary — Camden, N.J.

"Mobile" Cinerama Installation for Atlanta

A "mobile" Cinerama installation, which in a year or so, is scheduled to be packed up and moved to another location, will open on April 2 at the Roxy Theatre in Atlanta, Ga., the Stanley Warner Corp. has announced.

This movable equipment is designed for cities where a considerable potential audience exists, but where this audience is not likely to be large enough to justify both rebuilding a theatre and permanently installing Cinerama's complicated projection and sound equipment.

The equipment being installed in Atlanta includes three self-contained projection units and the special deeply curved Cinerama screen. In contrast to the situation at 15 other Cinerama theatres in the United States and Canada, all the necessary wiring is built into the movable projection rooms which are clamped to the floor of the theatre. The only reconstruction required is the removal of orchestra seats at the points where these projection rooms will be placed.

The Atlanta opening is expected to be the forerunner of a similar policy in other cities which cannot sustain runs of as long as a year for a single Cinerama feature. This is considered necessary to make a permanent installation profitable. With three Cinerama features soon to be available, an overall run of a year or more is expected for a city the size of Atlanta.

It is estimated that the temporary installation can be opened at a cost of $150,000 in contrast to a cost of $250,000 for a permanent setup. This cost includes the purchase of equipment, installations charges, and publicity and advertising expenditures. The mobile projection equipment costs about $80,000 as compared with $60.000 for the equipment in permanent installations, but it will be cheaper in the long run since it can be unclamped and moved once the audience is exhausted.

SPLICES NOT HOLDING ?

Film breaks are costly. Play safe by using

JEFRONA

All-purpose CEMENT

Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.

CAMERA EQUIPMENT CO.
DEPT. J-3-8
315 West 43rd Street New York 36, N. Y.

Superscope Aperture Changed To Standardize Projection

In a move toward standardization of anamorphic projection methods, the frame size of Superscope anamorphic prints has been changed so that it now requires exactly the same projection aperture as optical-sound CinemaScope prints. This change will give the Superscope screen image an aspect ratio of 2.35 to 1, also the same as optical CinemaScope. All changes in apertures and screen masking when optical CinemaScope and Superscope are double-billed are, therefore, eliminated.

Heretofore, Superscope prints required a square projection aperture so as to project a screen image of 2 to 1 proportions when expanded at the regular anamorphic expansion ratio of twice horizontally to once vertically. CinemaScope pictures are photographed for a 2.55 to 1 screen image when projected by means of magnetic-sound prints. Use of an optical sound track reduces the frame area and results in maximum screen ratio of 2.35 to 1.

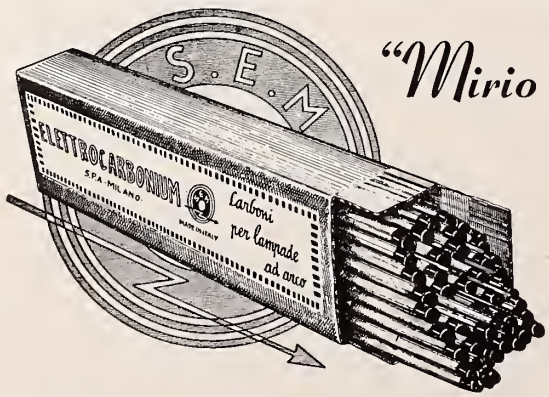
According to the Tushinsky brothers, originators of the Superscope process, the change in print specifications was made as a result of continued requests from theatres for more standardization. Superscope is a process by which a picture is photographed with standard cameras and lenses and later given an anamorphic squeeze at the laboratory stage. The process was described in greater detail in the article, "How Superscope Prints Are Made," in last month's issue of IP.

B & H Improved 16-mm Projector

Bell & Howell has announced a new model Filmosound Specialist, a 16-mm sound motion picture projector designed for heavy duty in schools, churches and industry. The new model is said to produce four times as much sound volume at low voltage as the previous one. The added power, not needed for normal operation, provides "reserve gain" to compensate for variation in film prints and to assure full sound volume in low voltage areas.

Increased sound volume is provided by a new fifteen (instead of ten) watt amplifier, a new voltage regulator which keeps the voltage to the photocell constant, and an eight (instead of a six) inch speaker.

For added volume and better sound distribution with large audiences, the accessory 12-inch speaker can be plugged into the single-case model and both the 12-inch and 8-inch speakers used simultaneously.



"Mirio"

ELETTROCARBONIUM
VIA BORGHETTO. 5 — MILANO (Italy)

N.T.S.

Your Guarantee of Consistent Quality and Outstanding Service For Every Theatre Need!

NATIONAL THEATRE SUPPLY
29 Branches Coast to Coast

New Cement Developed For Cronar Film

Successful tests have been completed on a new film cement which will make "cold" splices without the use of adhesive tape on DuPont's new Cronar film base, and this new product will soon be ready for market, it is reported by Roy Fisher, president of the Fisher Mfg. Co., Rochester, N. Y., which produces Ethyloid cement, widely used in projection rooms and exchanges for splicing acetate film.

The new cement will be needed as soon as Cronar film is introduced, Fisher said, because the polyester plastic from which Cronar is made is so stable chemically that it cannot be broken down or dissolved for the "weld" type of splicing action that takes place when two pieces of acetate film or the old nitrate film base are acted on by standard film cement. In addition, the chemical natures of cellulose acetate and Cronar film bases are different.

Loops of Cronar and acetate film containing multiple "cold" splices made with the new Fisher cement have been run through a projector as many as 4,200 times, Fisher claimed. Making a splice with the new cement requires a little longer "setting" time than with standard Ethyloid cement, he says, but the Cronar splice is made easy by a very simple splicing device which he plans to put in manufacture very shortly.

Department Store Theatres

"Department store" type theatres are springing up all over Japan. A department-store theatre, in case you didn't know, is a collection of individual theatres under a single roof, the same way as a department store is a collection of separate stores under a single roof. It works like this: when you want to see a movie, all you do is go down to the local theatre building and shop around for the kind of picture you like.

The Toho circuit is presently constructing an eight-story building in Yokohama to house four theatres, another in Hakata to house three theatres, and a new 1000-seater in Shibuya, Tokyo, being built over the existing Shibuya Toho Theatre.

Another multi-theatre project in Japan is Shockiku's new 11-story Tsukiji Kaikan Building housing three separate theatres, a 2000-seater for imported films, a 1500-seater for domestic products and a smaller 400-500 seat theatre for various types of stage shows.

Are You Moving?

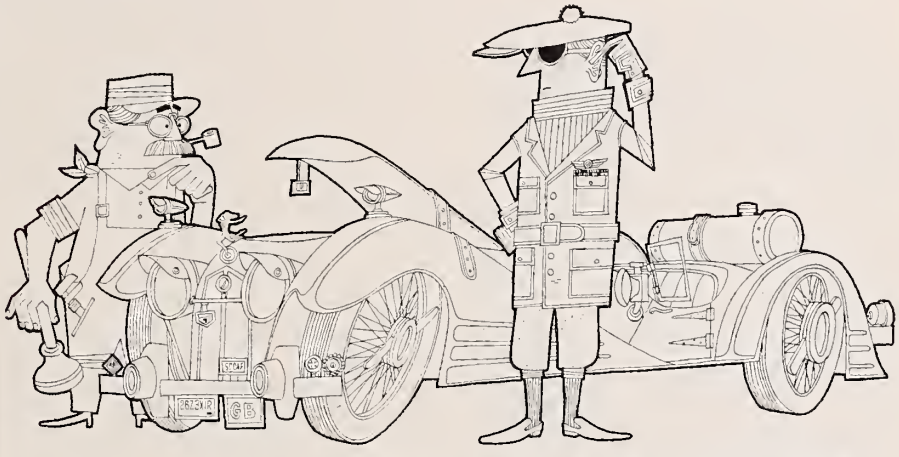
If so, please notify us one month in advance. The Post Office does not forward magazines. To avoid delay, please cooperate by sending us both your *new* and your *old* address.

New Four-Wall Theaters

Plans to build new four-wall theatres are very scarce these days, but at least two elaborate new houses have been announced for the East. A 1,450 seat theatre, completely modern in architecture and equipment, will be erected by the Skouras chain in Syosset, Long Island, N. Y., and a 1,200 seat theatre with the latest projection and sound equipment plus unusual facilities for patrons, will be ready this Spring in Arlington, Fla. Special aids for the hard-of-hearing and a nursery will be features of the Florida theatre.

Huge Closed-Circut Tv Show

Theatre Network Television's 95th closed circuit presentation, "Live Better Electrically," which recently launched the electrical industry's giant sales campaign, was the largest effort of its kind ever conducted by a business organization. An estimated 35,000 people saw the musical show in 79 different locations across the country.



YOU WOULDN'T LET A PLUMBER TINKER WITH YOUR CAR!

Your car plays a vital part in the life of you and your family. You wouldn't dream of letting a plumber tinker with it.

So, too, your sound equipment is the most important property in your theatre.

It deserves the expert technical attention only ALTEC can give it. 6,000 satisfied ALTEC SERVICE customers have learned this.

HOW ABOUT YOU?

ALTEC® SERVICE CORPORATION

SPECIALISTS IN MOTION PICTURE SOUND

161 Sixth Avenue • New York 13, New York



LETTERS TO THE EDITOR

(*Continued from page* 19)

that they contact only the perforation margins of the film.

When the plain, drum-type roller is used, the projectionist must keep the film-contacting surface scrupulously clean and free from burrs or scratches in the metal which might conceivably damage the film.

Pressure Against Film

Even though film tension in penthouse reproducers may seem rather low (3 to 5 ounces), it should be remembered that all of the "drag" on the film is exerted by direct contact with the curved surfaces of the pickup shoes. The pressure of the film against the pickup surfaces is therefore high—much higher than at any other point in the entire projector film path (exempting from consideration certain obsolete optical soundheads employing clock-spring pressure pads at the sound gate). This fact is an important factor in film multiation only insofar as the film rubs against places on the pickup head *other than the track-contacting shoes.* Excessive pressure may bend the film inward to rub against the very slightly depressed middle part of the pickup device. Result: "rain."

Optical-track prints, it is also well to remember, have sometimes been damaged as a result of penthouse soundheads being installed on a projector; but these prints, usually threaded up to bypass the impedance rollers and magnetic pickup of the reproducer, can receive a deep gouge rather than fine scratches. Damage to optical-track prints is due to misalignment of the film path rather than any defect of the penthouse attachment.

Guide-Roller Adjustment

Installation supervisors have been known to overlook the fact that different types of upper-magazine fire-valve boxes and different makes of projector mechanism may require special film-guiding rollers to be used in the penthouse reproducer to prevent the film from rubbing against the rough edges of the metal casing when entering or leaving the reproducer.

Omission of the rollers may make it impossible to run optical-track prints straight down through the penthouse reproducer without scratching the film. In a few instances even film threaded up for magnetic reproduction rubs against something and suffers serious abrasion.

It's up to the projectionist to insist upon immediate correction of a film path so far out of line that the film rubs against surfaces that will scratch it.

Refrigerated Film

To the Editor of IP:

The following question has been on my mind for several months, and I'll not be satisfied until I receive an authoritative answer: Have refrigerated films ever been known to buckle?

This is a film buckling period, and I wonder if anyone else has observed the following. Chilled film right off the truck comes from the projector lukewarm after showing. After the second showing of the same film, it comes from the projector just plain hot, say 40 or 50 degrees warmer than the first run. It is my opinion that it would be a simple matter to keep our prints in a little freezer when not in use. What do you think of that?

By the way, thanks for your article on matching projection optics (page 13, January issue). You can't review a subject like that too often.

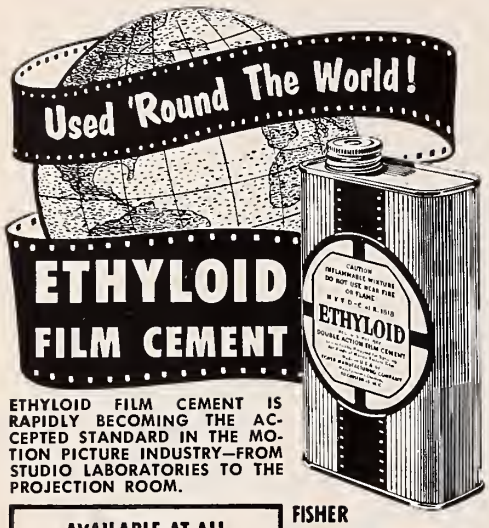
Al Kuiper

Terrace Theatre
Robbindale, Minn.

Comment: "Refrigerated" prints absorb moisture from the atmosphere, and this moisture is very likely to condense and spot the emulsion of the films. When moist film is projected, the combination of intense heat and moisture usually results in buckling. If the buckling is severe, as when high arc amperages are employed, the film may become permanently warped.

Raw stock comes from the manufacturer in tightly sealed cans, and is thus well protected from moisture. But the film must be allowed to warm up above the dew point of the air before unsealing the cans, otherwise condensation and film spoilage may occur.

Processed film—particularly theatre-release prints—are usually stored in the open, or in unsealed cans and shipping cases. When films which are exposed to moist air are chilled, the gelatine emulsion becomes saturated with moisture, or even spotted with tiny water droplets. Reels of film stored under these condi-



ETHYLOID FILM CEMENT IS RAPIDLY BECOMING THE ACCEPTED STANDARD IN THE MOTION PICTURE INDUSTRY—FROM STUDIO LABORATORIES TO THE PROJECTION ROOM.

AVAILABLE AT ALL THEATRE SUPPLY DEALERS

FISHER MANUFACTURING CO.
1185 Mt. Read Blvd
Rochester 6, N. Y.

Clayton Ball-Bearing Even Tension Take-Ups
For all Projectors and Sound Equipments
ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS.
SILENT CHAIN DRIVE
THE CLAYTON REWINDER
FOR PERFECT REWINDING ON 2000-FOOT REELS.
CLAYTON PRODUCTS CO.
31-45 Tibbett Avenue New York 63, N. Y.

for VistaVision, CinemaScope
Lorraine ORLUX SUPER-CHARGED **LARGE-CORED Carbons**
For DRIVE-INS & THEATRES with HUGE, WIDE-AREA SCREENS • CARBONS, Inc. BOONTON, N.J.
and all other Wide-Screen Presentations

tions may stick when unwound, or if not projected, may be spoiled by a mold that lives on gelatine.

Low temperatures are not necessary for the long-term storage of processed safety-film prints, but the relative humidity of the storage-vault air should not exceed 50%. On the other hand, air much drier than 40% relative humidity may cause partial dehydration of the base material and result in shrinkage and brittleness.

Prints in active circulation should not be refrigerated at all. We must warn against keeping prints in a freezer, for they might become very wet when removed. Projectionists in cold, damp climates should guard against rewinding film received on bitterly cold days until the rolls have had a chance to warm up to the temperature of the projection room. *It is especially necessary to avoid projecting cold film.*

It is true that damp film gets less hot running through a projector than does dry film. The temperature of film is somewhat lowered when moisture evaporates from it; but this phenomenon may buckle and otherwise damage the film as well as interfere with satisfactory projection. On the other hand, it is also true that the film does not get as hot during the first run as it does during subsequent showings for the obvious reason that the projector mechanism does not attain maximum temperature until an hour or two after the start of a continuous performance.

Even though it is the heat produced by direct arc irradiation that damages the emulsion of the film in some cases, most of the heat absorbed by film during projection comes from the hot gate runners and tension pads by conduction. It is the heat transferred from the gate that makes the film perceptibly warm as it winds up on the reel in the lower magazine. A "cold" projector—whether it be a machine just started up to run the first reel of the day, or a machine having a water-cooled gate—does not heat the film appreciably even when the arc radiation is strong enough to blister the emulsion.

HEAT-ON-FILM PROBLEM

(*Continued from page* 12)

even with heat filters. No condenser lamps were available for testing; but it may be assumed that slightly higher amperages may be burned in condenser lamps for increased picture brightness before the deleterious effects of heat make themselves apparent. But even though the thick lenses of condenser lamps absorb somewhat more infrared than does the thin glass of a mirror, manufacturers of condenser lamps recommend the use of heat filters at high arc currents.

Air Cooling Systems

Air cooling of the film in the aperture of the gate is a very popular method of minimizing the bad effects of heat absorbed by the emulsion. One form of air cooling, of more value for reducing the temperature of the mechanism than for protecting the film, is provided by specially designed rear shutters, both the cylindrical and "fan" types. The vaned cylindrical shutters of the Motiograph and many German projectors have proved very satisfactory for drawing cool air over the film gate and rear of the mechanism, expelling it toward the lamphouse.

Modern air-blast apparatus is designed to force a stream of cool air upon the emulsion side of the film at the aperture. The air reduces the temperature of the emulsion only slightly (about one-quarter as effective as a heat filter), and unless directed upon the film in a special manner, the air stream may induce distortion of the film and focus-ruining flutter.

The film-cooling air-blast attachment for the Simplex X-L is one of the more satisfactory arrangements. A "pulsed" stream of air is blown against the emulsion side of the film while a continuous "compensating" stream plays upon the celluloid side. By timing the rear blasts so that air blows upon the film emulsion for a short time at the moments when the blade of the shutter opens the light path, film flutter is greatly reduced. Without the air-pulsing modulating valve, air cooling of the film does not appear to reduce flutter, and it has the bad effect of inducing a "positive," or toward-the-lens, pincushioning of the film frames.

Even the most satisfactory air-cooling device does not do much more than prevent film shutter by the pulsed *pressure* of the air blast. The actual *cooling* effect is relatively small. Blistering of the emulsion occurs with air cooling at arc amperages only slightly higher than the currents known to blister film when no cooling is used.

To be specific, approximately 75 amps. in simplified HI mirror lamps, or 80 amps. in rotating-positive mirror lamps, is the maximum when air cooling, alone, is used. At 85 amps.

Splicing Problems Are Coming!

If you're thinking of ordering a new splicer, be smart and investigate the Ace Clear Vision Splicer, a completely new method.

- It makes a strong splice on acetate.
- Will splice the new DuPont Cronar base and join Cronar to acetate.
- It is non-magnetic — Will not injure CinemaScope soundtracks.



Ace Electric Mfg. Co., 1458 Shakespeare Ave., New York 52, N. Y.



STILL the lowest... and one of the finest...

HILUX

264 & 152

FIXED & VARIABLE ANAMORPHIC LENSES

$197.50 EACH $395.00 PER PAIR

See your Theatre Supply Dealer or write us directly . . . NOW

PROJECTION OPTICS CO.

ROCHESTER, NEW YORK

in simplified, or 90 amps. in rotating-positive mirror lamps, flutter may or may not occur, depending upon the pressure factors of the pulsed air current. With air cooling alone, blistering of dense black-and-white emulsion is apt to occur at 100 amperes.

We may conclude that air cooling of the film may be troublesome in operation, and inferior to effective heat filters. Air cooling permits, on the average, an increase of only about 10 amps. in arc current, and is never advisable for use with simplified HI mirror lamps.

Now we come to water cooling, another highly vaunted method of maintaining a low operating temperature of machine and film.

Water Cooling Advantages

Water-cooled film gates effectively lower the temperature of the film base. The film gets warm because the hot gate runners conduct heat to it. When water cooling is used, the film winds up practically cold in the lower magazine.

Even though most of the heat absorbed by the film comes from the gate runners and pads, the really damaging heat is that absorbed from the arc beam by the photographic emulsion. This "skin heat" travels into the base very slowly; and the total amount of this heat (measured in calories) is rather small. But because it is concentrated in the thin gelatine emulsion during the brief flashing intervals, the temperature at the very surface of the emulsion attains surprisingly high values (measured in degrees).

If the emulsion gets hotter than 80° C., it is in grave danger of blistering. (The surface temperature usually gets higher than 100° C., the boiling point of water, when the "mean" temperature of the emulsion, top, middle, and bottom layers considered, is about 80° C.) Water cooling of the gate does not, and cannot, reduce the temperature of the irradiated emulsion.

Water-cooled gates make projection a more comfortable occupation and possibly minimize such permanent deformation of the film as buckle and fluting. It also helps to prevent the shrinkage of nitrate films and brittleness in acetate films. But this cooling method does not prevent either heat flutter or blistering of the emulsion.

The combination of heat filters and air-cooling of the film provides maximum protection, even though discontinuance of the air cooling would not necessarily affect projection results. When both methods are used together, projection is satisfactory up to 130 amps. burned in rotating-positive mirror lamps (120 amps. for filters alone). Severe flutter and blurring of the focus begins at about 140 amps. (130 amps. for filters alone), and rapid alternations of focus at 150 amps. (140 amps. for filters alone). Blistering of the emulsion occurs in the neighborhood of 200 amps. (about 150 amps. for filters alone).

Maximum Heat Tolerance

It is safe to assume that dense silver-image black-and-white films cannot withstand more than 150 amps. without damage even when all available cooling means are used together. (With no cooling means at all, the limit is in the 75—80 amperage range.) Dye-image color films, on the other hand, can stand much higher currents.

As far as mirror-arc radiation is concerned, Technicolor imbibition prints will stand fully 180%, and dye-coupler multilayer prints (Eastman Color, Ansco Color) from 140% to 150% the maximum light that photographically dense black-and-white films can take. An Eastman Color print, for example, may be projected without damage at mirror-arc currents up to about 135 amps. even without heat filters or air cooling! We have to figure our maximum permissible currents on the basis of regular black-and-white film, however, because monochrome prints will probably always be used, and are even preferable to color prints for certain types of photoplay.

Henri Chretien Dies: Developer of CinemaScope Process

Professor Henri Chretien, developer of the anamorphic lens which revolutionized motion picture production and projection techniques throughout the world, died last month at the Walter Reed Hospital in Washington, D. C. He was 79.

Professor Chretien developed the anamorphic lens in France and for many years was unsuccessful in attempts to interest producers in the new method. Finally, in 1952, Spyros P. Skouras, president of 20th-Fox, and Earl I. Sponable, research head, witnessed a demonstration at Chretien's home in Nice, and they were immediately enthusiastic over the potentialities. Nine months later, "The Robe" appeared on wide screen with four-track stereophonic sound, and captured the interest of theater men and movie goers the world over.

Formerly Honorary Professor of Optics at the Sorbonne in Paris, Professor Chretien had been living in Washington with his daughter.

Q: When is a mistake a blunder?

A: When a projectionist is not a regular subscriber to IP—a MUST reading for the projectionist craft.

Use the handy order form below

INTERNATIONAL PROJECTIONIST
19 West 44 St., New York 36, N. Y.

Enter my subscription for ☐ 1 year (12) issues—$2.50
☐ 2 years (24) issues—$4.00

Foreign and Canada: Add 50c per year

Name .....

Address .....

City ..... *Zone* ..... *State* .....

Young Miss Maass bet her life



EVEN at 6:00 A.M., it is warm in Havana. But young Miss Clara Louise Maass felt chilly. Her head ached. Worse, she knew nothing would help.

The illness starts like any other febrile attack. But soon the face is flushed. There is high fever. After two or three days, the pulse becomes feeble, the skin cold and of a lemon-yellow tint. Chances of recovery hardly approximate 50%.

In seven pain-wracked days, yellow fever killed Clara Louise. And it was her own doing.

At Las Animas Hospital, Cuba, in 1901, volunteers were needed for the famous U. S. Army yellow fever experiments.

And she, who had fearlessly nursed the worst fever cases, thought undergoing the disease herself would make her a better nurse. She asked to be bitten by an infected mosquito. "I tried to dissuade her," said the medical director. "But she insisted."

So, in what would soon be America's victorious battle against yellow fever, Clara Louise Maass bravely died as she had lived —for others.

Yet the steel of her quiet, devoted courage still gleams in the strength of today's Americans. For it is still American courage and character that make our country secure— and that actually back our nation's Savings Bonds.

That's why U.S. Savings Bonds are among the world's finest investments. That's why you're wise to buy them regularly, and hold on to them. Start today!



★ ★ ★

It's actually easy to save money—when you buy Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done *for* you. The Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, when held to maturity. And *after* maturity they go on earning 10 years *more*. Join the Plan today. Or invest in Bonds regularly where you bank.

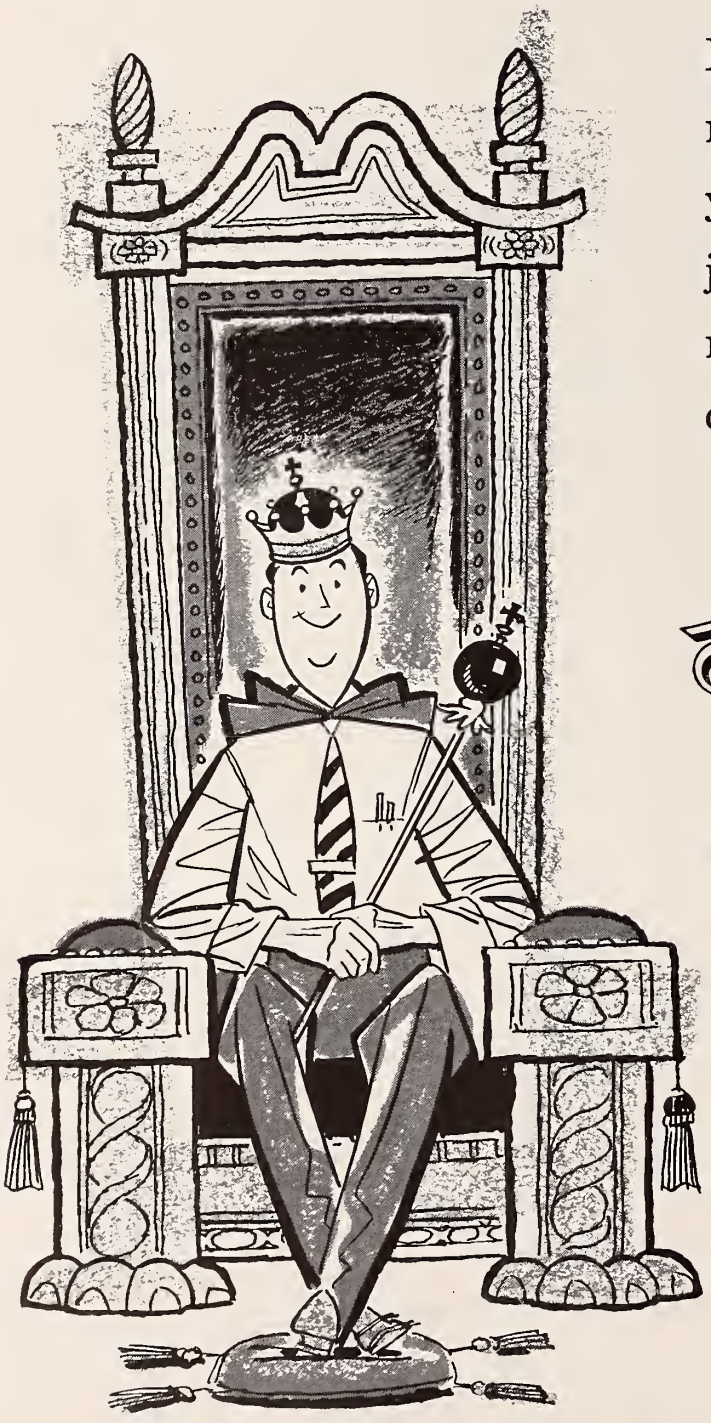
Safe as America – U.S. Savings Bonds

PUBLIC SERVICE ADVERTISING COUNCIL

The U.S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

IN YOUR PROJECTION BOOTH . . . YOU are the master! It is YOU who is responsible for having the sharpest possible picture on the screen . . . perfect sound adjustment . . . smooth change-overs . . . and everything else that makes for top quality motion picture exhibiting.

The most vital asset to your kingdom is your equipment. When it performs well . . . YOU share the credit. Let it falter and YOU share the blame.



By having the world's finest and most dependable equipment as your partner . . . you can do your job easier and better. The equipment we're referring to, of course, is

Simplex
T.M. REG. U.S. PAT. OFF.

the PRIDE of YOUR WORLD!

Simplex X·L
T.M. REG. U.S. PAT. OFF.

PROJECTION and SOUND SYSTEMS

MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION • DISTRIBUTED BY NATIONAL THEATRE SUPPLY
SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

PROJECTIONIST

INTERNATIONAL



APRIL 1956

VOLUME 31 • NUMBER 4

30c A COPY • $2.50 A YEAR

No lamp in the World!

CAN PRODUCE SO MUCH LIGHT.

Peerless HY-CANDESCENT TRADE MARK REG

CINEARC

NOT A REFLECTOR ARC!

WRITE FOR DATA

Peerless MAGNARC TRADE MARK REG

CINEARC

A 75-77 AMP. REFLECTOR ARC!

22,000 TOTAL LUMENS ON SCREEN

NO-HIGH-RATE

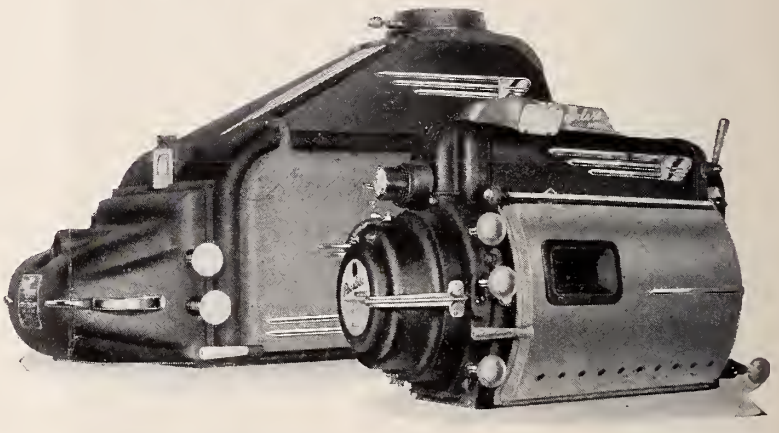
— PROOF —

Hy-Candescents were selected for all **important** "CINERAMA" installations. (Chicago, New York, Los Angeles, San Francisco, Philadelphia, and Washington, D. C.)

Hy-Candescents were chosen by Paramount for all installations of Horizontal "VISTA-VISION".

Hy-Candescents were again selected by TODD-AO for "OKLAHOMA".

You have to do the same if you want all the light there is for big pictures.



At 75-77 amperes . . . With presently available and standard 8 x 9 m/m copper coated carbons . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . With a 14" diameter No. 2012 PEERLESS "Hy-Lumen" glass reflector that retails at a list price of $22.00 F.O.B. Chicago . . . With a No. 2880 PEERLESS Tail Flame Flue . . . On any kind or any size screen . . . No Heat Filter required.

All of this, at the **lowest** possible first, and operational **cost**. And —

OF ($60.00) REFLECTOR BREAKAGE AND SILVERING DETERIORATION OR HEAT FILTER UPKEEP !

J.E. McAULEY MFG. CO.

552-554 WEST ADAMS STREET

CHICAGO 6, ILLINOIS

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

National Carbon Company

Wishes to thank the
Motion Picture Industry
and members of the Academy
of Motion Picture Arts
and Sciences

For the honor paid its

Development and production
of a high-efficiency

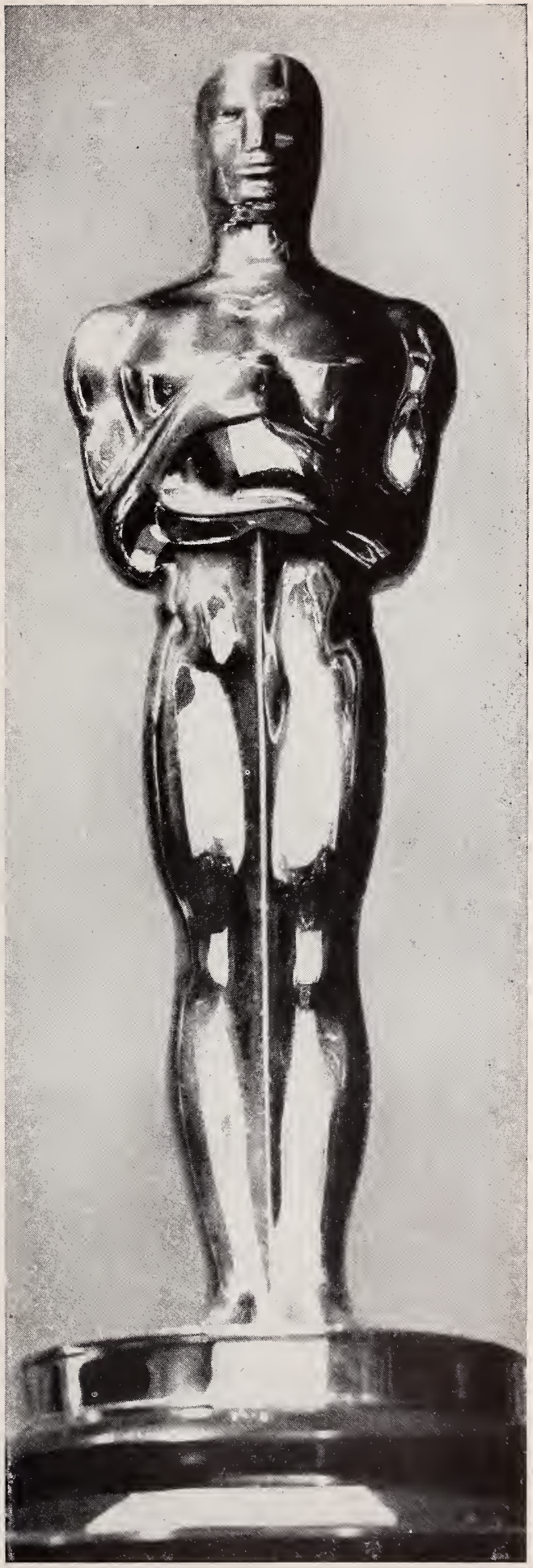
Yellow Flame Carbon

For Motion Picture
color photography

★

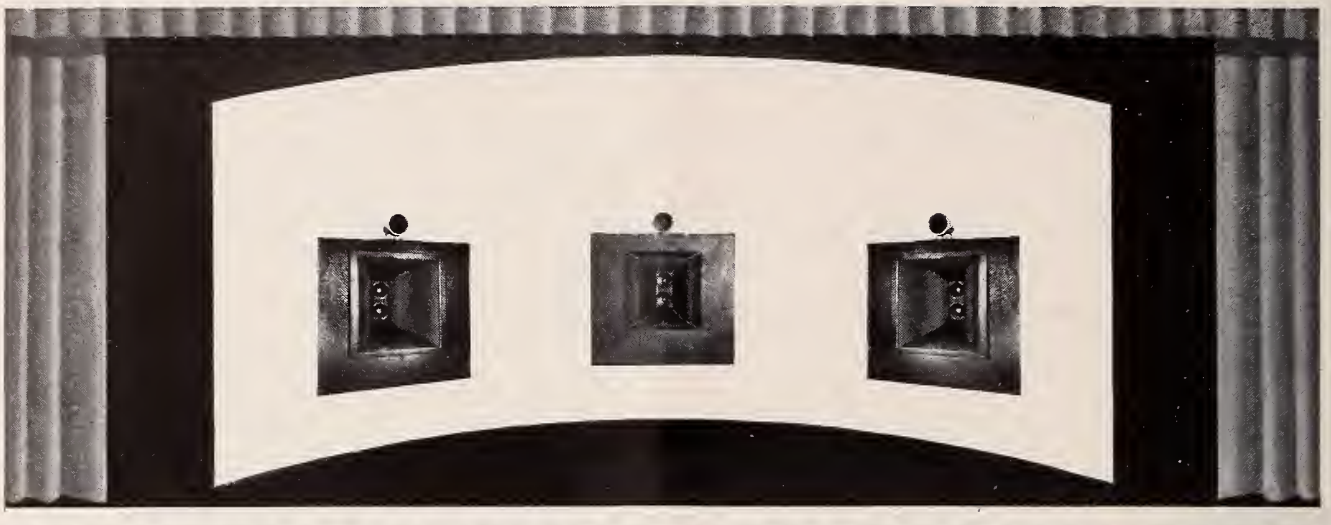
Class One for Technical Achievement

NATIONAL CARBON COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N. Y.
Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco
IN CANADA: Union Carbide Canada Limited, Toronto



STEREOPHONIC SOUND* IS BETTER

THAN ANY SINGLE CHANNEL SOUND





Give your customers the best

Get the full dramatic brilliance of sound of today's top-rated motion pictures!

The new Westrex Stereophonic equipment reproduces the full range, tone and quality recorded on the film. This new equipment is simpler in design and cheaper to install and maintain. Prices are 5% to 30% lower than comparable 1955 equipment.

FOR THE BEST in multi- or single channel, magnetic or photographic sound systems ...buy

- **THE WESTREX**
- **WESTREX Standard**
- **WESTREX Economy**

*Three channel, four channel, or six channel

Westrex

Westrex Corporation

111 Eighth Avenue, New York 11, N. Y.
Hollywood Division: 6601 Romaine Street, Hollywood 38, Calif.

International PROJECTIONIST

R. A. ENTRACHT, *Publisher*
JAMES MORRIS, *Editor*
R. A. MITCHELL, *Contributing Editor*

Volume 31 **APRIL 1956** **Number 4**

Index and Monthly Chat 5

More Light for Drive-In Screens 7
ROBERT A. MITCHELL

How to Get More Out of Your Arclamp 14
ARTHUR J. HATCH

Projection and Sound Requirements of the Drive-In Theatre 16
BARRY PASSMAN

Is the Drive-In Here to Stay? 18
JAMES MORRIS

Metal vs. Glass Reflectors 19
E. B. HEYER

In the Spotlight 20

Drive-In Projection Lenses 22
J. FETHERSTON

The Ole Cranktwister 23
F. MACDONALD

Painting the Drive-In Screen 24
LEONARD SATZ

Obituaries 25

Reverse CinemaScope Lens for Drive-Ins 26
BOB DENEEN

IA Elections 27

Fire Safety for Drive-In Theatres 30

Miscellaneous Items, News Notes, Technical Hints

INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co., Inc., 19 West 44 Street, New York 36, R. A. Entracht, President. Telephone: MUrray Hill 2-2948. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States and U. S. Possessions, $2.50 per year (12 issues) and $4.00 for two years (24 issues). Canada and Foreign countries: $3.00 per year and $5.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Entered as second-class matter February 8, 1932, at the Post Office at New York, N. Y., under the act of March 3, 1879. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles.

Entire contents copyrighted 1956 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

420

Monthly Chat

Importance of the Drive-In

FROM the projectionist's point of view, the drive-in theatre has a two-fold importance. First of all, it is a fast-growing and healthy segment of the exhibition industry, and therefore a reliable even if mostly seasonal source of employment. Secondly, it is a type of operation where the skill and experience of a good projectionist are all-important.

Despite the carnival-like trappings characteristic of a profitably-run drive-in—many of which have kiddy parks and big concession areas capable of providing anything from a soft drink to a full meal—the drive-in is still a film theatre which depends on the quality of the image on its giant screen to attract customers.

Slight inefficiency in projection equipment or its adjustment or maintenance can waste enough light to leave an already inadequate screen image miserably dim. Many pioneer drive-ins were labeled with disparaging nicknames such as "passion pit," etc., partly because they began operating before today's more powerful and improved projection equipment was available. Customers didn't take seriously the idea that they were being invited to watch the often barely perceptible picture.

Those days are gone forever. The drive-in is now regarded as a completely respectable place of family entertainment. Better equipment, plus the "know-how" gained from ten years of experience and experiment in projecting pictures on outdoor screens now make it possible to obtain a drive-in screen image almost equal in quality to that expected in the average indoor theatre.

This issue of IP is a special number devoted to articles on drive-in projection. These articles by acknowledged authorities examine the minimum equipment requirements of a first-class drive-in theatre and describe carefully thought out maintenance and operating procedures to increase projection efficiency in difficult situations.

Victor and Still Champ

A COUPLE of months ago we commented in this column that much of the entertainment value of a film such as "Richard III," produced in full color with scenery and costumes of great beauty, would be lost when this film was shown on TV. We suggested that most of the tremendous audience—estimated at up to 50,000,000—who saw it telecast on the Sunday afternoon of March 11, would want to see this film again in the theatre where they could really appreciate it. Newspaper and magazine critics who saw both versions, the TV premiere in the afternoon and the theatre premiere that evening, felt there was no doubt that viewing "Richard III" in the theatre was a vastly more stimulating experience.

However, let's not fool ourselves. The telecast was most entertaining also, and it suffers only in comparison with the showing of "Richard" in the theatre. Further, it was free and could be seen without stirring from the house, standing on line or buying tickets. There is certainly a place for *both* TV and the motion picture theatre; but unless the exhibition industry really exploits the technical advantage provided by first-class projection, it is likely to find the future bleak.



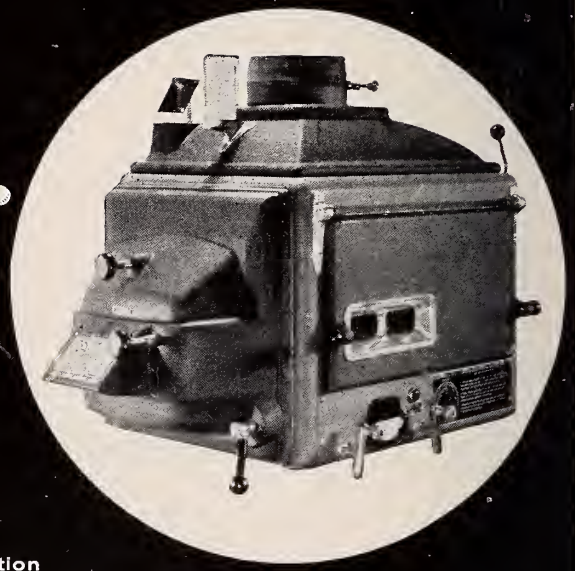
"Want a light, mister?"

Want a really good light on your screen—

regardless of how big—

regardless of the projection process—

regardless of the film width?



EXCELITE "135"

PROJECTION ARC LAMPS

New conversion features ready for your adoption when you equip for wide film presentation include provision for burning 20-inch 13.6 mm carbons, a wider opening in the nose, a dowser which covers the bigger opening, and a new high magnification mirror. The Excelite "135" comes equipped with an 18" f 1.7 or 16-1/2" f 1.9 reflector and burns a choice of 9, 10, or 11 mm regular or 10 mm Hitex carbons, with single control amperage selection. Long-life positive carbon contacts. (Water-cooled carbon contacts optional.) Automatic Crater Positioning System prevents color change in screen light. Air jet arc stabilization keeps tail flame from reflector. Prevents deposit of soot and formation of heat absorbing scum which causes mirror breakage. Blower cooled removable Reflect-O-Heat unit for reducing aperture heat. Unit construction.

IT'S FROM N.T.S

NATIONAL THEATRE SUPPLY

Division of National • Simplex • Bladewerk Inc

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

INTERNATIONAL PROJECTIONIST

VOLUME 31 APRIL 1956 NUMBER 4

MORE LIGHT for DRIVE-IN SCREENS

By ROBERT A. MITCHELL

Adequate lighting of large drive-in theatre screens is probably the most difficult technical problem faced by the exhibition industry today. The following article explains what light levels are now possible and describes the equipment necessary to obtain them.

DRIVE-IN THEATRES have unfortunately been characterized by woefully inadequate levels of screen illumination. The very largest drive-ins are admittedly faced with almost insuperable illumination problems; but there is little excuse for the intolerably low light levels so often found in drive-ins having screens of from 50 to 60 feet wide—the great majority. The popularity of these theatres would be even greater if the pictures were not so eye-strainingly dim.

Screen brightnesses of from 10 to 20 footlamberts prevail in most indoor theatres having adequately lighted pictures. As a matter of fact, American Standard Ph22.39-1953 specifies a brightness between 9 and 14 footlamberts for satisfactory projection. More than half of all drive-ins have light levels of only 2 to 4 footlamberts, and very few have as much as 9 footlamberts, the minimum standard for indoor theatres!

The use of more powerful arc lamps is certainly the most obvious way to improve the brightness of drive-in pictures; but this is only one of several expedients too important to be overlooked.

Coated projection lenses having an optical speed of not less than *f*/2 are a "must" for successful drive-in projection. Not only do antireflection-coated lenses transmit more light than old-style uncoated lenses, but they also give crisper images with brighter highlights and deeper blacks.

The Shutter Factor

The projector mechanism must also be considered, for different types of shutter transmit different percentages of the total light. The obsolete single-rotor, fan-type rear shutter cuts off and wastes from 55 to 60% of the light, transmitting only 40 to 45%, depending on the width of the shutter blades. Projector heads having this light-wasting type of shutter should not be used in drive-in theatres.

The front-and-rear combination shutter is a more efficient type because of its double action in opening and closing off the light path. Similar in action and efficiency is the double-rotor rear fan shutter having two sets of blades revolving in opposite directions. Hence, as the time needed to cut the light off the screen and restore it is reduced by one half as compared with the "single" shutter, the screen receives proportionately increased illumination.

The most efficient of all motion-picture machine shutters are the cylindrical, or drum, type and the conical, or dished, type.

The cylindrical shutter (used in the Motiograph and in most European projectors) is double-acting, for when the edge of one blade cuts down into the light-beam, the edge of the other blade cuts the beam in the opposite direction. The conical shutter (employed in the Simplex X-L and in certain English machines) is a single-rotor type, but is positioned so close to the aperture that the cutoff is very swift. Both cylindrical and conical shutters, when properly designed, transmit very nearly 50% of the light without "travel ghosts." A shutter light-transmission of 50% is the maximum possible when standard "3-to-1" geneva intermittent movements are used.

Projectors for drive-in use ought to have more rapid intermittents than the old 3:1 geneva movement. A 5:1 in-

termittent, for example, permits the use of a shutter transmitting to the screen fully 66% of the total light. (The claw intermittents used in 16-mm projectors are all 5:1 movements.) Although several satisfactory 5:1 sprocket intermittents for 35-mm projection have been proposed (e.g. the Powers pin-cross movement, the accentric-star movement described by Jose Ruiz in the November 1955 issue of IP, the oscillating-cam intermittent invented and described by J. G. Jackson in the February 1955 issue of IP, and various "drunk-cam" movements), projector manufacturers seem to overlook the many advantages of the more rapid movements. Intermittents having the 5:1 speed ratio should have been introduced at the time CinemaScope and widescreen projection came into vogue.

This writer has repeatedly warned projectionists in conventional theatres against excessive trimming of the blades of fan-type shutters for increased light transmission. The gain in light—seldom more than 4 or 5%—is insignificant, and the danger of spoiling the picture with flicker, travel ghost, and image tremble is very great. It is preferable, we have said so many times, to have the shutter blades too wide than too narrow, especially when screen illumination is high.

Our advice to projectionists in drive-in theatres is quite different. Every lumen is important in outdoor theatres having gigantic screens. Now, because a *slight amount* of travel ghost cannot ordinarily be seen at low levels of picture brightness, the projector shutters in these theatres may be trimmed down considerably to gain that precious 4 or 5% of extra screen light. (But in no case should the shutters ever be trimmed to give more than 50% transmission. To go beyond this limit unavoidably introduces a large amount of streaky, flickering travel ghost.)

It is interesting to note that certain projector manufacturers furnish a choice of shutters for each of their machines—a wide-blade shutter for superior, flicker-free picture quality in conventional theatres and a narrow-blade shutter for maximum screen illumination in drive-in. Most other manufacturers make adjustable shutters to permit the projectionist to use the exact width of blade best suited to the conditions of his theatre. Only cheap or old-fashioned shutters have to be trimmed with tinsnips, a delicate operation because any difference in the width of the two blades results in violent 24-cycle flicker.

The brightness of a projected picture may be reduced to three fundamental factors, namely (1) the amount of light sent to the screen by the projection lens (2) the area, or size of the screen, and (3) the percentage of incident light which the screen reflects. Let's consider the last factor.

It stands to reason that a screen having poor reflecting power will give a dimmer picture than a screen that does a good job reflecting the light it receives from the projectors. The most powerful arclamps, the largest coated lenses, and the most efficient projector shutters struggle vainly against lumen-devouring gray or dirty screens. Light *absorbed* by the screen never reaches the eyes of the audience.

Light-Wasting Screens

It is truly astonishing how large a number of drive-in theatres have screens of such low reflective power that nearly half of the light falling upon them is "killed" by absorption. No screen surface reflects *all* of the light falling upon it—even the very whitest screen paints absorb at least 15% of the light, and nearer 20% when aged and exposed to the dust invariably present in the air. But screen reflectivities in the neighborhood of 80% are not only possible, but quite usual among properly surfaced white drive-in screens. This reflectivity is from 5% to 7% higher than that of a good "indoor" matte screen perforated for sound transmission.

The most light-wasting of drive-in screens are those surfaced with unpainted, or inadequately painted, composition panels not specifically selected for the highest degree of whiteness. The reflectivities of these unsatisfactory surfaces range from about 40% to 60%. Compared with efficiently reflecting screens, these surfaces are light gray, not white.

White-pigmented asbestos-type panels are considerably better, even when unpainted. The whitest surfaces of this class reflect from 65% to 70% of the light. This cannot be considered too good for a non-perforated movie screen, however; and since every lumen counts in drive-in projection, something even whiter should be used for the screen surface. We must use

Screen Lumens and Arc Current Needed for 4 FOOTLAMBERTS OF SCREEN BRIGHTNESS

F/2 lamp and coated lens, 50% shutter, standard 0.825" x 0.600" aperture (or C'Scope aperture with anamorphic lens). Heat filters at 80 amps. and higher.

PICTURE WIDTH (Feet)	60%-REFLECTING MATTE SCREEN		80%-REFLECTING MATTE SCREEN		100%-REFLECTING SPECULAR SCREEN		120%-REFLECTING SPECULAR SCREEN	
	Lumens	H.I. amps.	Lumens	H.I. amps.	Lumens	H.I. amps.	Lumens	H.I. amps.
40	7,730	Mirror, 80	5,800	Mirror, 65	4,640	Mirror, 50	3,870	Mirror, 45
45	9,900	Mirror, 100 / Cond., 145	7,430	Mirror, 80	5,940	Mirror, 65	4,950	Mirror, 55
50	12,000	Mirror, 120 / Cond., 190	9,000	Mirror, 95 / Cond., 140	7,200	Mirror, 80	6,000	Mirror, 65
55	14,670	Mirror, 145 / Cond., ?	11,000	Mirror, 110 / Cond., 175	8,800	Mirror, 90 / Cond., 135	7,340	Mirror, 80
60	17,600	?	13,200	Mirror, 135 / Cond., 200	10,560	Mirror, 110 / Cond., 175	8,800	Mirror, 90 / Cond., 135
65	20,370	*Impractical*	15,280	Mirror, 150 / Cond., ?	12,220	Mirror, 125 / Cond., 185	10,190	Mirror, 100 / Cond., 145
70	23,800	*Impractical*	17,850	?	14,280	Mirror, 140 / Cond., 200?	11,900	Mirror, 120 / Cond., 190
75	27,500	*Impractical*	20,630	*Impractical*	16,500	?	13,750	Mirror, 140 / Cond., 200?
80	30,940	*Impractical*	23,200	*Impractical*	18,560	?	15,470	Mirror, 150 / Cond., ?
90	39,000	*Impractical*	29,250	*Impractical*	23,400	*Impractical*	19,500	?
100	48,660	*Impractical*	36,500	*Impractical*	29,200	*Impractical*	24,330	*Impractical*

This table gives the arc amperages (and corresponding projectar ar screen lumens) needed ta praduce 4 faatlamberts af brightness an drive-in screens. Optimum adjustment af the high-intensity arclamp is assumed (75% side-ta-center light distributian an screen); but because different lamps and carbans vary as ta light autput, the illuminatian values given in this table are anly appraximate. It is recammended that mare than 4 faatlamberts af screen brightness be abtained wherever passible, but in na case shauld light fall belaw this minimum value.

announcing the new "Red Arrow"

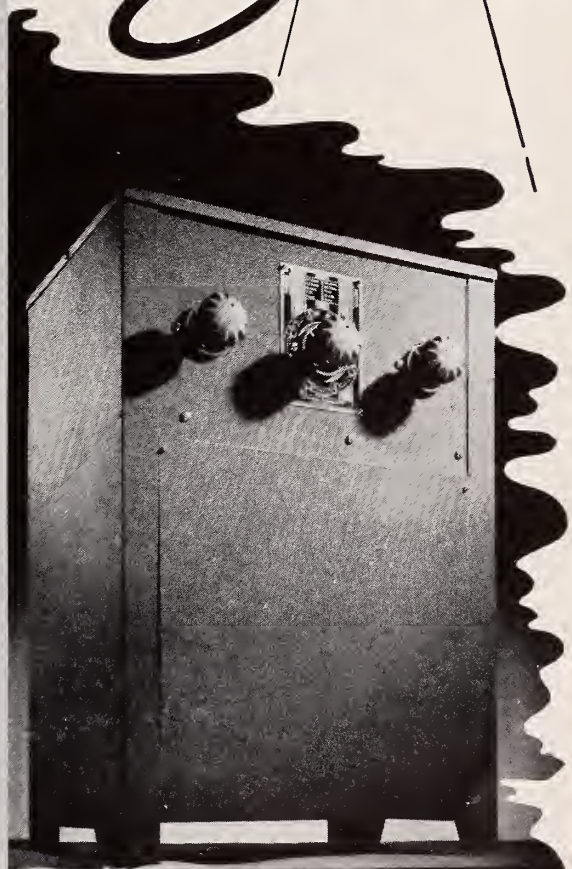
90 to 135 Ampere SELENIUM RECTIFIER by Strong

Never Before Has Such a High Quality Rectifier Been Offered at Such a Low Price!

Engineered by arc lamp and rectifier specialists, the new Red Arrow possesses desirable features heretofore reserved for more costly equipment. It is without question the most efficient, economical rectifier ever developed for converting three phase alternating line supply current to direct current for use at the arc.

Output control is made simple by convenient tap switches located on the front of the rugged heavy gauge sheet metal case. The selenium plates are completely moisture-proof to insure reliable operation in damp climates.

Ventilation is by forced draft provided by a heavy duty fan which cools the plates to room temperature. The plates are sufficiently spaced so that the draft passes between them and in direct contact with the rectifying surface.



For use with angle or coaxial trim high intensity projection arc lamps

Send coupon today for complete information

THE STRONG ELECTRIC CORPORATION

31 City Park Avenue — Toledo 2, Ohio

Please send free literature on Strong Rectifiers.

NAME_____

THEATRE_____

CITY & STATE_____

NAME OF SUPPLIER_____

a screen paint to cover the composition panels.

There are many white paints to choose from—so many, in fact, that, unless the choice is made with care, we run the risk of using a paint which is unsuitable for outdoor motion-picture screens. A glossy paint, or one intended for interior use, is manifestly unfit. Exposed to wind and sun, rain and snow, heat and cold, a paint for drive-in screens must be weatherproof.

The reflecting power of a white screen paint is an extremely important matter, inasmuch as the sole function of a screen is to reflect light. And we are interested in the reflectivity when the paint has become somewhat aged.

The reflectivities of commercial white paints are difficult to specify, and impossible in the case of paints that darken upon exposure to sunlight, air, or chemical fumes, or with the passage of time. Magnesium carbonate is a white pigment that has a reflectivity of 88% when exhibited in the form of a freshly shaved block; but this substance has scant "covering power,"

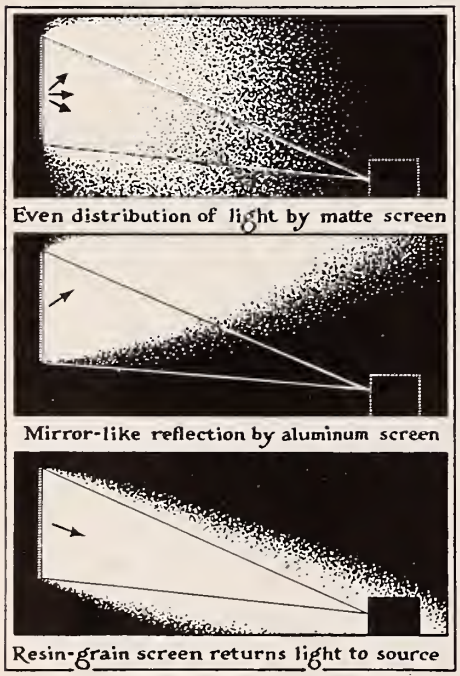


FIG. 1. Distribution of reflected light by the three basic types of drive-in screen. Matte (flat white) screens give the most uniform spread of light over the viewing area, while specular (aluminum and beaded) screens reflect the light in a directional manner. It will be noted that aluminum and other metallized screen surfaces reflect most of the light at an angle opposite the angle of projection—in the case of up-tilted projectors, into the sky. Resin-grain and beaded screens, on the other hand, return the bulk of the light toward the projectors, regardless of projection angle and screen tilt.

and accordingly must be applied in thick layers to be effective. Titanium dioxide is almost as reflective, and it better conceals the material to which it is applied: zinc oxide ("zinc white"), a common white pigment of moderately good covering power, is rated at 82%—84%.

The basic carbonates of lead ("white lead") have high reflectivities and excellent covering power, but must be avoided for movie screens because of their pronounced tendency to turn, first yellow and then brown, upon exposure to fumes containing sulfur. Automobile exhaust gas contains very little sulfur, but paper-mill sulfite fumes and coal gas (a common "trace ingredient" of the atmosphere in the vicinity of industrial towns) are rich in the element that darkens white lead.

Recommended Course

The safest course—and one that we strongly recommend—is the use of a screen paint prepared especially for drive-in screens. There are several good ones on the market; and one of the best is magnesium-carbonate vinyl resin, commonly known as "white plastic skin." This surfacing may be sprayed or brushed on the screen, and is impervious to weather and time.

A satisfactory screen surface can be obtained only if the "foundation" of composition weatherproof panels has been properly prepared to receive the paint. It is suggested that the seams and joints be sealed with a grease-free compound, and that the entire screen surface be wiped free from dust and dirt before the undercoat is applied. An undercoat of bright aluminum paint will insure a uniform surface and increase reflectivity if the white finish lacks perfect covering power. As many coats of white screen paint should be applied as is necessary for a smooth, pure white surface.

The finished matte screen should have a reflectivity of about 80%. This is the approximate reflectivity of a freshly shaved piece of the best white chalk (calcium carbonate). Any surface having less than 80% reflectivity is too light-wasting for drive-in screens.

Specular, or directional, screens are more efficient lightwise than matte, or diffusive, screens, and for this reason they are being increasingly considered for use in the larger drive-ins. Even though the overall, or "diffuse," reflectivity of a specular screen is somewhat lower than that of a good matte screen (scarcely more than 65% for an aluminum screen, and 50% for a beaded or resin-grain screen), such a screen throws most of the light it receives back inside narrow angles, and hence provides *apparent* reflectivities of 100% to 200% (averaging 120% for weathered aluminum screens) inside *restricted* viewing angles.

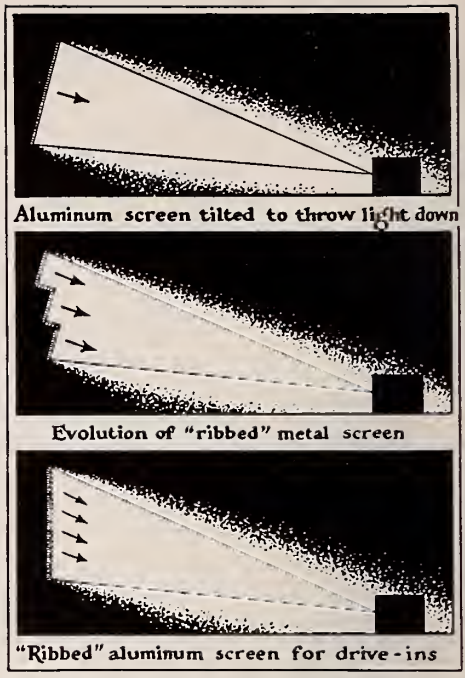
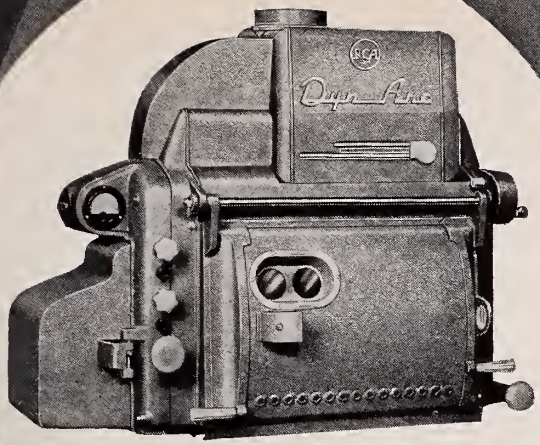
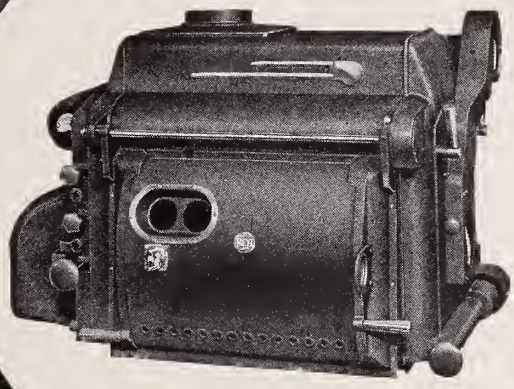


FIG. 2. Aluminum-painted and *vertically-corrugated* aluminum-plate screens may be needed in some of the larger drive-ins to concentrate the light. Such screens, however, must be tilted forward at an angle equal to the upward projection angle to reflect the light down into he viewing area. When the metallized screen is a painted one, satisfactory sidewise distribution of the reflected light is obtained by applying the aluminum paint to a rough, or "pebbly," screen surface. By corrugating an aluminum-surface screen with *horizontal* ridges, however, satisfactory downward reflection characteristics may be obtained with an untilted aluminum screen. The middle drawing illustrates the principle on which this experimental type of screen works. Commercially available aluminum-plate screens, such as the Manco-Vision screen having a highly reflecting chemically prepared surface, make use of *vertical* corrugations for a wider spread of the light.

Aluminum screens have a number of serious disadvantages which can be minimized only by the most careful manufacture and judicious installation. In the first place, metalized screens reveal irregularities of surface as dark, shadowy streaks that mar the unformity of illumination. They also rob the side viewing areas of light, giving a picture much dimmer than that provided by matte screens when observed at angles greater than 30 de-



RCA DYN-ARC



RCA WIDE-ARC

Brightest Lights in the Drive-in Picture

Wide-screen projection needs all the light you can give it. And to show big wide-screen box-office hits successfully, your drive-in needs RCA Projection Lamps. Powerful, rugged RCA Wide-Arcs for performance that's both efficient and economical . . . the latest, advanced RCA Dyn-Arcs for the maximum possible light with an f1.7 lens and screens 140 feet wide.

RCA Wide-Arcs and Dyn-Arcs give *more light per ampere* than any other projection lamp for drive-in use. Even through thousands of showings, "Instant Acting" ventilating assembly keeps reflector cool and free of carbon dust. There's an automatic water circulator to keep over-all operating temperature low.

With a large, high-speed reflector, RCA Projection Lamps distribute more light to the screen with more even distribution. Low speed carbon rotation provides maximum stability. Whether you use standard or Hitex carbons, low burning rate saves operating dollars. And only Dyn-Arc design will allow you to use larger, higher-amperage carbons when such operation becomes technically feasible.

The most projection light at the least possible expense . . . that's the RCA Wide-Arc and Dyn-Arc story. Your independent RCA Theatre Supply Dealer can fill you in on the details. Contact him *now* . . . be ready with wide screen when they start driving in!

THEATRE EQUIPMENT
RADIO CORPORATION of AMERICA
ENGINEERING PRODUCTS DIVISION CAMDEN, N.J.
In Canada: RCA VICTOR Company Limited, Montreal

grees from the center line. They impart a grainy appearance to the picture when the screen surface is pebbled for better light distribution over the viewing area. Unless tilted forward at an angle equal to the upward tilt of the projectors, metalized screens throw the bulk of the light up into the sky where it is wasted.

The effect of aluminum screens on color pictures is interesting. They increase photographic contrast and chromaticity, and in so doing they magnify errors of color balance and impart a garish quality to the reproduced color. Matte screens soften the color, blend the halftone in a more natural way, and increase visibility of the finer, more delicate photographic detail. And yet aluminum screens give better results during the early hours before the sky is totally dark.

Resin-grain and beaded screens have reflection characteristics rather different from those possessed by aluminum screens, and they are so strongly directional that patrons seated beyond 15 degrees from the center line see a washed-out picture, while patrons near the middle of the viewing area see a picture which may be even 300% brighter than a matte screen could give. A roughened surface for beaded and resin-grain screens (the latter being similar to the "Scotchlite" material used for reflective road signs) *does not* increase the angles of light distribution! Neither does tilting these screens have any effect on the direction of the reflected light! Resin-grain screens should always be positioned vertically and have smooth surfaces.

Directional Characteristics

The directional characteristics of specular screens should be known to all projectionists. Theatre owners are usually non-technical individuals who are inclined to be overly impressed by the glib claims of sales representatives. Let it be remembered, therefore, that aluminized screens reflect light mirror-wise, viz. at an angle equal to and *opposite* the angle of the incident light, whereas resin-grain screens return the light in the direction of the projectors *regardless of the angle of incidence.* Curvature and tilt are mighty important factors in the performance of aluminum screens, but are totally without result in the case of resin-grain screens. No matter how a resin-grain screen is curved or tilted, the bulk of the light is *always* thrown back toward the source.

Special metalized screens have been manufactured for drive-ins. The simplest one consists of corrugated plates of chemically treated aluminum, the corrugations directing the light down into the viewing area and spreading it all over the ramps. This screen works well, but it is quite expensive. Another screen, so far produced only on an experimental basis by the well-known motion-picture engineer J. G. Jackson of Port Alberni, British Columbia, consists of an array of small concave mirrors set into backing material. Jackson's screen may be used for the projection of motion pictures during the hours of twilight when general illumination is too high for satisfactory projection on other types of screen.

Modifying Reflectivity

The highly directional characteristics of resin-grain screens may be modified by covering the surface with a *very thin*, semitransparent coat of weatherproof magnesium carbonate paint. A sprayer must be used, as variations in the thickness of the surface layer show up as light and dark streaks. If the work is expertly done, the screen will assume the properties of both matte and specular screens, giving a less bright picture as seen from the middle of the viewing area, but a brighter picture as seen from the sides.

When all screen, mechanism, and lens factors have been selected for maximum illumination efficiency, the all-important matter of the arclamps remains. Without lamps of adequate light-generating power, the most rapid coated lenses, the most efficient projector shutters, and the whitest, most highly reflective screens go for naught.

Arclamps for drive-in projection should be high-intensity, properly powered, and, if of the reflector variety, fitted with glass mirrors of the best quality. Metal (rhodium-plated) mirrors are less efficient, as they reflect somewhat less visible light and more of the longer infrared rays which are absorbed by glass. With metal reflectors, therefore, the picture is less bright and the film gets hotter, arc amperage remaining the same.

Whether reflector or condenser lamps are used, the lamp optical system should have a geometric speed of not less than *f/2*. It can be demonstrated mathematically that *f/2* projection lenses are too "slow" to match *f/2* lamp optical systems; and an increase in lamp speed without a correspdonding increase in lens speed does not produce the desired results.

Use of Heat Filters

Heat filters (known to scientists as "minus-infrared" filters) *must* be used to prevent severe film flutter and possible blistering of black-and-white emulsion whenever the arc current exceeds 80 amperes in mirror lamps. Heat filters of good quality absorb about 65% of the invisible infrared radiation and only 10% of the visible light. Because the heating effects of the infrared and the visible radiations are about equal when HI mirror arcs are used, heat filters reduce heating of the film by 38% or 40%, and are highly recommended for black-and-white projection.

Because dye-image films are relatively transparent to infrared rays, the heat filters may be removed for a 10% increase in picture brightness when natural-color films are shown. Many observers can perceive no difference in screen brightness when the filters are removed, however, indicating that the absorption of visible rays by these filters is sometimes less than 10%—perhaps as low as 7% or 8%.

Even when heat filters are employed, mirror-arc currents in excess of 140 amps., and condenser-arc currents greater than 185 amps., should be avoided for the projection of silver-

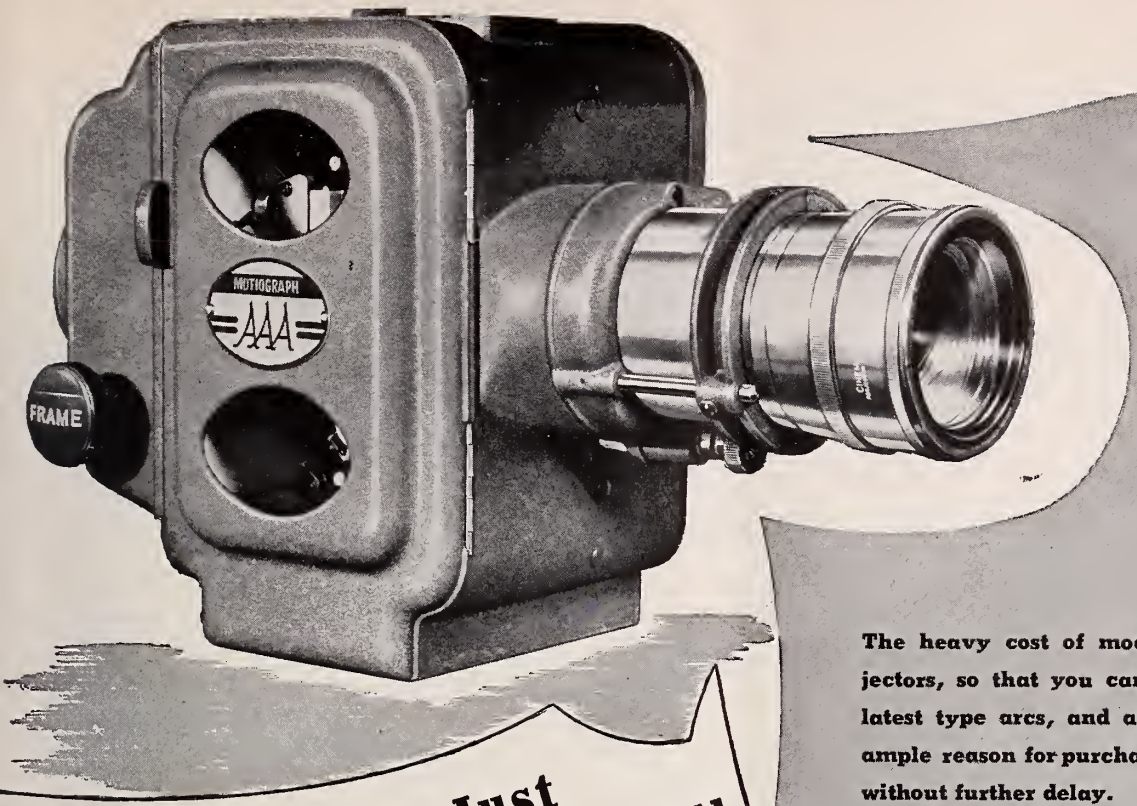
(*Continued on page* 32)

Foul (Weather) Play

Drive-in as well as indoor theatre operators now have a new complaint against TV tactics. This is the "overdramatization" of TV weather forecasts.

It seems that the theme song of many TV forecasters is: It's Never Fair Weather—or—When It Rains, It Pours (and it pretty near always rains, according to some of these announcers). The logic of this is simple: when it rains it rains pennies into the TV coffers.

One annoyed exhibitor expressed it this way, "Just let there be a cloud in the sky, and right away the TV boys warn people to be careful, not to drive, to stay home if possible. You keep repeating stuff like that, and it can be murder on the theatres and other businesses that depend on people leaving their homes."



Why It's Just Good Business To Install

Motiograph AAA PROJECTORS Now!

The heavy cost of modifying your old projectors, so that you can play all prints, use latest type arcs, and avoid film damage, is ample reason for purchasing new Motiographs without further delay.

★ **PROJECT ALL TYPES OF PRINTS**—standard, CinemaScope, or combination optical and magnetic—without interchange of sprockets, rollers, shoes or tracks.

★ **CORRECT WORKING DISTANCE BETWEEN APERTURE AND MIRROR** with any make or model lamp including the new, big reflector arcs.

★ **MAXIMUM SCREEN ILLUMINATION.** Best center to side light distribution.

★ **AIR AND WATER COOLED GATE AND FILM.**

★ **ROCK STEADY PROJECTION.** Silent operation.

Now, more than ever, your projector dollars go farther with long-life Motiographs. There are no other projectors like them.

Your Motiograph dealer will gladly serve you. He has a liberal financing plan. Write today for literature.

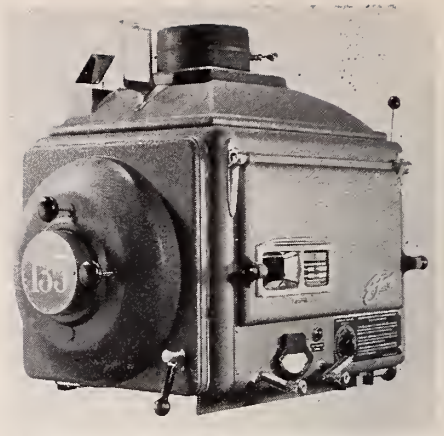
Motiograph, Inc. "SINCE 1896"

4441 W. LAKE ST., CHICAGO 24, ILL.

Export Division (Except Canada): Frazar & Hansen, Ltd., 301 Clay Street • San Francisco 11, California

PROJECTORS • SOUND SYSTEMS • IN-CAR SPEAKERS • GENERATORS

How to Get More Out of Your ARCLAMP



The powerful Super 135 is the newest arclamp in the Strang line. It features an 18-inch, f/1.7 reflector, advanced cooling means and automatic arc-gap control.

Now, at the beginning of the season, examine your outdoor screen image. In this article an expert makes suggestions for improving lamp performance.

By ARTHUR J. HATCH

The Strong Electric Corporation

THIS SPRING is an appropriate time to conduct a review of the screen lighting requirements of your drive-in theatre. A complete evaluation of your present projection arclamps, their installation, and auxiliaries should be made to determine if the present equipment is adequate and delivering to the screen what it is supposed to. Perhaps your lamps can be made more effective by installing conversion parts, or it may be necessary to talk to the boss about getting a demonstration of a more powerful model in your theatre.

If the same screen size that was illuminated last year is again to be used and if the illumination was satisfactory and did not suffer when compared to other nearby theatres, the same carbon and amperage can probably be used again. However if the screen size has been changed or the light was unsatisfactory last year, there is the possibility of getting more light by changing carbons or increasing current. The accompanying chart, Fig. 1, shows the change parts for the Strong Mighty 90 and Super 135 for various carbon trim and current ranges and the illumination values that can be obtained.

Adaptable to Many Trims

All Super 135 and Mighty 90 lamps can be adapted for any of four carbon trim for use on any 35-mm projection system by proper combinations of negative heads, positive drive motors, carbon contacts and carbon drive roller sets. Heat filter and blower assemblies are generally needed at the higher currents and with the larger diameter re-

FIGURE. 1. Combinations for 35-mm Projection Systems

Reflector Dia.	Range Total Lumens To Screen, No Shutter, No Filter, F2.0 (16½" Ref.) F1.7-1.8 (18" Ref.), Coated Lens (1, 2, 3)	Arc Ampere Range	Arc Voltage Range	Range Continuous Burning Time Without Retrim	Carbon		Positive Motor	Positive Carbon Drive Roller Assy.	Negative Lead Screw	Positive Contacts
					Pos.	Neg.				
16½" 18"	15,500-19,500 18,000-22,500	75- 85	50-55	78-53 Min.	9 mm	5/16	300:1	9-10 mm	5 thr. lead	9 mm
16½" 18"	18,500-21,000 21,000-24,000	82- 90	53-60	60-44 Min.	9 mm	5/16 11/32 above 85	216:1	9-10 mm	5 thr. lead	9 mm
16½" 18"	16,000-20,000 18,500-23,000	90-100	55-62	78-53 Min.	10 mm	11/32	300:1	9-10 mm	5 thr. lead	10 mm
16½" 18"	18,000-21,500 21,000-25,000	97-105	60-64	58-43 Min.	10 mm	11/32	216:1	9-10 mm	5 thr. lead	10 mm
16½" 18"	18,000-22,000 21,000-25,500	110-118	60-65	75-45 Min.	11 mm	3/8	300:1	11 mm	6¼ thr. lead	11 mm
16½" 18"	20,500-23,500 23,500-27,000	115-124	63-68	60-40 Min.	11 mm	3/8	216:1	11 mm	6¼ thr. lead	11 mm
16½" 18"	22,500-25,500 26,000-30,000	124-135	63-70	55-30 Min.	10 mm Hitex	7/16	216:1	9-10 mm	6¼ thr. lead	10 mm

1. Total through 2.66:1 ratio aperture of standard width 50% less.

2. Total through 2:1 ratio aperture of standard width 30% less.

3. Total through CinemaScope aperture approximately 22% more.

flectors and will fit any Strong lamp of these types now in use.

Water cooled contacts can be furnished as optional equipment for 9-, 10-, or 11-mm operation and require the use of one water circulator for each lamp. If water circulators are already in use with projector water cooled gates, they may be connected to cool the positive contacts also. While the water cooled positive carbon contacts reduce the light by 3 to 5%, the life of the contacts is increased over the air cooled variety.

A new feed control calibration and operation instruction side panel plate has been devised to replace the panel that was calibrated in amperes on older models and is available together with a revised operating instruction book complete with trouble shooting chart. On this new instruction panel, the feed control is calibrated in inches per hour positive carbon burn for either ratio motor and for any carbon trim.

Faster Reflectors

If your theatre is presently equipped with Strong Mighty 90 or Super 135 lamps with 16½ inch diameter reflector and your size of picture and throw is such that the required focal length of projection lens permits the use of *f*/1.7 or *f*/1.8 objectives, then an increase in light of approximately 15 to 18% can be realized by installing a Super 135 with 18 inch diameter reflector. Reflectors in lamps of this type built since April 1955 can be interchanged between 16½- and 18-inch diameter.

If the arc amperage is to be raised above 100 amperes and your Strong lamps were built prior to October 1954, you should make sure that the lamps are equipped with a ventilated reflector frame and air intake port underneath the rear door nameplate. A conversion for this cooling unit can be obtained from the factory and should be installed to prolong reflector life at high arc currents.

Of course, if the lamp amperage is to be increased, the capacity of the rectifier or motor generator should be checked as it is courting disaster to overload these power supply sources. For projectionists who prefer rectifiers, Strong builds the 90-135 ampere "Red Arrow" selenium rectifier to properly power the Super 135 and Mighty 90 lamps.

In the process of reviewing your present equipment to make sure that it is doing everything that it is capable

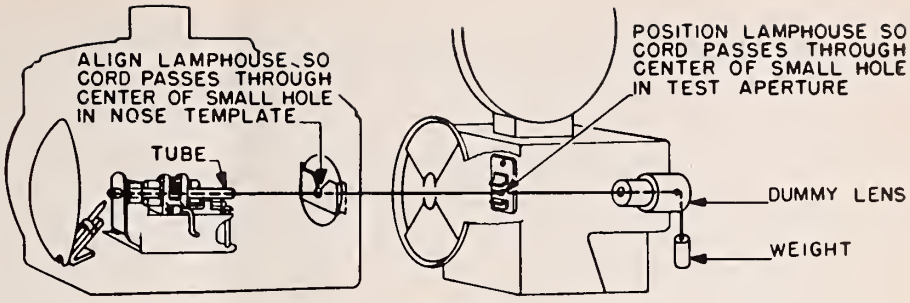


FIGURE 2

of, and since the efficiency of the lamphouse in putting light on the screen is directly related to its proper alignment to the projector gate and lens, it will be well to check this important factor again even though this was carefully attended to on the original installation.

At least two reference points in the lamphouse which establish the optical center line must be held in exact line with both the center of the projection aperture and the center of the lens. It is not possible to have the optical system of lamp and projector correctly aligned unless these four points are in line. On the Strong Mighty 90 and Super 135 one reference point established by the manufacturer is the positive carbon contacts and the other is the center of the nose opening.

Aligning Procedure

An aligning kit consisting of a length of string through a dummy carbon, nose centering device, aperture plate centering hole, and dummy lens are furnished by Strong with each pair of lamps. As a result of the careful use of this tool, the lamphouse will be aligned so that its optical axis is in line with both the center of the aperture and the center of the lens. The use of this tool is shown in Fig. 2.

Prop the fire shutter open, open change-over dowser and turn projector mechanism by hand so that shutter blades are clear. The projector lens should now be removed and the tube with the cord attached, passed through the lens holder and into the lamphouse. The tube should be clamped in the positive carbon contacts and drive roller assembly exactly as illustrated. Place the dummy lens in the projector and locate the test aperture as shown. The test aperture is held by closing the projector film gate.

Tentatively position the lamp so that the cord passes through the center of the hole in the test aperture. Then insert the nose template in the lamphouse nose and further position the lamp sideways or up and down so that the cord passes exactly through the centers of the holes in both the test aperture and nose template. It may be necessary on some types of projector bases to make use of shim washers either at the front or rear or at both ends of the lamphouse base to bring the lamphouse to the correct alignment with the projector optical system.

Ventilation Requirements

One of the important factors that is generally overlooked when increasing arc amperage and even many times improperly allowed for on original installations is the matter of lamphouse ventilation. An exhaust system that was adequate for smaller lamps or lower currents fails at higher currents.

Suprex or copper coated carbon type lamps could be adequately ventilated by small fans of 50-150 cubic-foot-per-minute capacity as their total heat dissipation was in the order of only 2 kilowatts. Rotating high intensity type arcs burning up to 105 amperes dissipated a maximum of 6 kilowatts and could be adequately ventilated by a medium size fan of the centrifugal type.

However, with the increase of currents to 110- and 135-ampere ranges with power dissipation up to 9½ kilowatts, experience has shown that special attention must be paid to all details of the fan installation if proper removal of fumes and products of combustion is to be accomplished along with proper cooling of the reflector, and lamphouse.

Furthermore experience in numerous theatres, backed by exhaustive laboratory tests has shown that discoloration of the silver backing and fracture of reflectors from heat differentials are both a function of the temperature of the reflector. Complete absence of reflector failure by discoloration and fracture have been obtained by proper

(*Continued on page* 31)

Projection and Sound Requirements of the Drive-in Theatre

By BARRY PASSMAN
International Projector Corporation

Although projection equipment is made up of interchangeable components, it is most important to remember that all units of the arclamp-projector-lens chain must be designed so as to work together. This is equally as true of sound systems.

DRIVE-IN theatres have come of age. This season many exhibitors will be reviewing existing projection equipment with a view to modernizing and improving picture and sound quality. In the past year or so important advances have been made in the design of arc lamps, lenses, projection and sound equipment; regardless of whether or not you are expanding your theatre or putting in a larger screen, you should consider the advantages to be gained by the use of the latest equipment.

For example, we are all well aware of the problems associated with getting enough light on a drive-in theatre screen—compared with accepted standards for indoor theatres we have a long way to go. In many installations the picture is very poor particularly at the beginning of the show during the mid-summer months.

Fortunately, projection equipment is designed on the basis of several major interchangeable components. This means that we can install a new lens or a new arc lamp without buying a new projector. When doing this, however, there are several pitfalls of which we must be conscious.

Matched Components Needed

Each year for instance, the automobile industry announces advances and improvements in transmissions, body styling and motors; we may be very enthusiastic about having another 50 horse power, but there are very few of us who purchase a 1956 V8 motor and install it in a 1946 automobile. Quite apart from the fact that the 1946 car may be in perfect condition and even assuming that the new motor would fit without too much trouble we realize that the transmission, steering, brakes and rear end of the old car would not be able to handle the loads imposed by the new high H.P. motor. Perhaps we do not always realize that exactly the same kind of conditions exist in respect to our projection equipment. If we are to avoid "projection bottlenecks" we must consider the equipment as a projection *system.*

The arclamp is the starting point in the picture projection system and several important factors must be considered; if the screen size or capacity of your drive-in has been increased since last year it is more than likely that you need more light. If you already have a pair of Excelite lamps you will be interested to know that modification parts including drive motors, carbon contacts and roller kits, heat filters and larger diameter mirrors are available to provide more light.

[*Editor's note: The illumination values which can be obtained with the latest National Exelite arclamps under various projection conditions are shown on a table which appears on page* 14. *The data given in that table can be applied to both the National Excelite and the Strong lamps.*]



FIG. 1. Simplex XL projector with magnetic soundhead an anamorphic lens.

Before considering new Excelite "135" lamps with 18-inch diameter mirrors (or replacement of your 16½-inch mirrors) you must check picture size and throw to determine if an *f*/1.7 or *f*/1.8 projection lens is available to fit your projector; in other words you must match the arclamp and projector optical *system.* If you do not feel that new lamps or modification of existing lamps is possible or necessary, you may find that a useful light increase can be obtained merely by checking the alignment of your arc lamps. An alignment kit and instructions are furnished with every National Excelite lamp; even though the job was properly done when the lamps were installed it is most likely that some slight adjustments may now be necessary.

Ventilation Important

If you do install new lamps or modify your existing lamps to use larger carbons, be sure to provide the specified ventilation. For example, at 110 to 135 amps it is necessary to have a minimum air velocity of 700 linear feet per minute. Discoloration and fracture of mirrors will result if this vital item is overlooked. It perhaps goes without saying that you must have a motor generator or rectifier of adequate capacity to handle the current required by your new or modified lamps.

The next major component of the system is the projector itself (Fig. 1); the arclamps may be capable of providing all the light needed, however, before it reaches the screen it must pass through the projector and the film. As the light beam approaches the aperture it must pass through a

funnel formed by the baffles in the rear of the projector.

Older model projectors were not designed for use with modern high speed arc lamps and the new larger apertures, such as CinemaScope. If the baffle openings are too small, illumination of the corners of your picture will be poor. The standard Simplex XL projector is cleared for an *f*/2 light beam with a full CinemaScope aperture. The Simplex XL projector is also available with a water-cooled film trap and clearance for an *f*/1.7 light beam. The water cooled gate and trap assembly is recommended for use with new lamps such as the Excelite "135" to facilitate threading and handling the projector parts. Water cooled "Traperture" and *f*/1.7 light clearance kits (Fig. 2) are available for modification of standard XL mechanisms in the field.

Filters Protect Film

It should be pointed out, however, that the temperature of the gate and trap parts has no significant effect on the heating of the film itself which is subjected to the *direct radiation* of energy from the arc lamp. At the higher light levels heat reflecting or heat absorbing filters will be needed to prevent in-and-out of focus effects (film buckle and flutter) or in extreme cases, scorching and blistering of the film. Such filters will be necessary regardless of whether or not the water cooled trap is used. You should also bear in mind that black and white film is considerably more sensitive to overheating than color film.

In considering the light transmission of a projector we must always remember that we have to throw away about half the light produced by the arclamp. This is, of course, due to the action of the shutter. In the drive-in model of the XL projector a light transmission efficiency of 60% is obtained without perceptible travel ghost at light levels commonly obtained in drive-in theatres today. A cone shutter, which cuts the light beam at approximately 1¼th inches from the film, provides an extremely fast cut-off. You will appreciate that as the shutter is moved farther from the film the light beam becomes larger, hence the shutter takes longer to completely cover and uncover the light beam. This is the key to the very high light transmission efficiency of the XL mechanism.

Though in drive-in theatres "travel ghost" is not usually a problem because of the low light level on the screen, you should carefully check for this condition by observing the special SMPTE test reel or regular title shots. It may well be that the shutters on your projectors were cut down and that you are now using more light and/or larger CinemaScope apertures; either of these changes will result in a more noticeable degree of travel ghost.

So far we have considered the projector only in terms of light transmission. However, due to the tremendous magnification commonly used in drive-in theatres today, picture steadiness is a vital factor. The use of a CinemaScope anamorphic lens itself will double the effective lateral unsteadiness on the screen. Since the intermittent sprocket is responsible for the exacting job of registering each frame in the aperture with micrometer accuracy, it is important that the sprocket teeth be kept scrupulously clean and free from dirt and grime deposited there during the passage of film. Frequent use of a stiff bristled tooth brush will prevent the build-up of dirt which. if allowed to continue, can cause an unsteady picture. Occasionally, the intermittent sprocket should be checked for worn rims or undercut teeth which can also cause unsteadiness. A definite increase in film noise is a good indication that the intermittent sprocket is undercut and should be replaced. Since the feed sprockets on the XL projector have 24 teeth, very little wear can be anticipated and hence, little or no maintenance other than cleaning will prove necessary.

Care of Nylon Rollers

During operation, only one of the two pad rollers on each feed sprocket should rotate when the pad roller arms are properly adjusted. This takes place because the pad rollers located nearer the front of the projector on the upper and lower feed sprockets act only as guards in preventing damaged film from accidentally slipping off the feed sprockets.

On the other hand, the two inner pad rollers on the upper and lower feed sprockets should rotate because the film loops bear against these pad rollers. To check the pad roller assemblies for proper film engagement, the pad rollers should just clear a double layer of film wrapped tightly around the sprocket. If adjustment is necessary, simply turn the pad roller arm adjustment screw located opposite the pad roller arm as required.

Best performance from the all-nylon pad rollers is obtained if no oil or other lubricants are present on the pad roller shafts. If the nylon pad rollers turn sluggishly, remove the pad roller shafts by loosening the retaining set screws located in the pad roller arm and remove all traces of oil.

The lens holder of the XL projector will adequately support the smaller series of anamorphic lenses without the use of external supporting devices. With the larger series of anamorphic lenses which are commonly used with four-inch diameter projection lenses, an anamorphic lens support is necessary. The bracket holding the anamor-

(*Continued on page* 28)

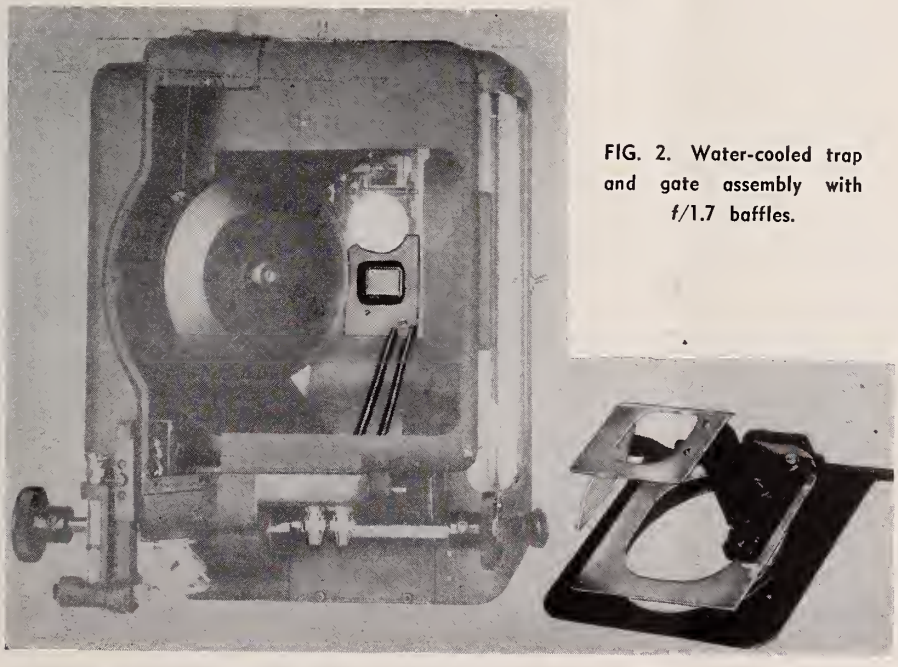


FIG. 2. Water-cooled trap and gate assembly with *f*/1.7 baffles.



Two different pictures can be shown at the same time at this twin-screen drive-in.

Is the Drive-In Here to Stay?

By JAMES MORRIS

Not only have drive-ins proven themselves, they have become an essential part of the motion picture exhibition system

THE SPECTACULAR expansion of the drive-in theatre business is a post-war phenomenon. In 1946 there were about 300 drive-ins, but by the beginning of 1956 there were almost 5000. This rapid growth took place while a number of conventional theatres were closing and many of them were suffering from Tv competition.

Some experts now think the drive-in business is reaching a saturation point so far as the total number of theatres is concerned. Certainly one can find many instances of overbuilding. One theatre equipment man who recently returned from a tour of the South remarked about seeing three shoddy-looking drive-in theatres on the same highway built practically against one another. Also, indoor houses aren't the only theatres that have closed. Many supposedly quick-profit drive-in operations have folded in the last few years in the face of competition from better-designed and better-equipped outdoor theatres.

Americans Like to Travel

What is the future of the drive-in theatre? Nobody can be sure, but one thing seems certain: Americans have not shown themselves to be the sort of people who will be dominated by an entertainment pattern that keeps them in the home, tied to a Tv set. They're generally restless and like to roam, even if it's only for a short trip down the road. The number of automobile owners is rising steadily, and a tremendous nation-wide road-building program is under way. This means that in years to come more people will be traveling by car and patronizing all kinds of roadside services. The motel business, for instance, has mushroomed in much the same manner as the drive-in industry.

While the motel caters to the vacationist or long-distance traveler, the drive-in theatre serves the automobile owner who takes the family for a short evening outing. The well-run drive-in will have facilities for amusing children and is often able to serve the whole family a full meal. The average outdoor theatre tries to serve an area of about 10 miles in radius. Ideally, this area should contain 50,000 or more inhabitants to supply an adequate flow of customers.

It is interesting to note that drive-in theatre growth is a result of North American post-war prosperity and that they flourish only in the United States and southern Canada. There are exceptions—areas, for instance, like South Africa and Australia, where the drive-in is beginning to come into its own—but it is really only in North America that a sufficiently large proportion of the population are car owners and where roads are good enough and plentiful enough.

The British Isles might have been a promising field for drive-in construction, particularly since many theatres were destroyed in the war, but the foggy atmosphere that prevails in many British population centers is a serious deterrent. Also, not so many people own cars. There might be a high level of prosperity in a country such as Sweden, but that country is too far north. Not only would the season be short, but the Midnight Sun might create a most formidable stray light problem.

The drive-in field is one of violent contrasts. There are still "theatres" that consist merely of a couple of old telephone poles erected in a field with a screen of plywood nailed across them. Sound comes from a speaker nailed to one of the poles. It may surprise some projectionists to learn that this type of drive-in usually operates with 16-mm projection equipment. Fifty cars may drive into a field at night to watch such a performance.

Trend Toward Bigness

On the other hand, there is now a considerable number of drive-ins of the type shown in the accompanying illustration. This is a twin-screener which can provide excellent viewing conditions for 1000 or more cars and also play two different features simultaneously. An even newer idea in the drive-in field is the indoor-outdoor type of operation which contains a fair-sized indoor theatre in addition to a giant outdoor screen.

After taking a quick look at the operational problems faced by a drive-in theatre, one comes to the conclusion that it is in many ways a very strange business. First of all, it is usually a seasonal business. Secondly, it can only operate for part of the evening, that

Aluminum reflective surfacing increases efficiency of metal arc mirrors where great light output is needed.

Metal versus Glass Reflectors

By E. B. HEYER
Heyer-Shultz, Incorporated

AS WE all know, larger drive-in screens make it necessary to intensify illumination in order to obtain sufficient screen brightness. A resulting problem has been breakage of glass arc mirrors from the heat generated in powerful new high-intensity lamps and in older lamps that have been "souped up" to provide more light.

Generally, converted lamps were not designed for proper ventilation after being "souped up." The result is that not only extra heat but an excess of arc smoke deposit has to be contended with. These new conditions, coupled with the striking of a far hotter arc, not only cause cracking and breaking of mirrors, but also make for excessive pitting and general deterioration.

In new reflector arclamps burning over 100 amperes, the mirror breakage problem is even greater. There are many reasons for this. We have found, for instance, that these lamps are often coupled to old ventilating systems designed years ago for a far smaller arc and lamphouse. Even with a ventilating system of the proper size, the upper half of a mirror can reach a temperature of 550 degrees Fahrenheit. One of the most common causes for mirror breakage at drive-in theatres is cold air striking the hot mirror.

Another reason for mirror breakage has been traced to the burning of the arc. The inclined arcs used today are different from the old "in-line" Suprex arc. With the "in-line" arc an erratic carbon would only break or freeze the arc. Improper striking of this type of arc would simply blow out the core of the positive carbon. No particular damage could be done to the mirror, except for some extra soot deposits and, possibly, extra pitting.

The inclined arc is a different story, however. Erratic feeding or burning of the carbons, or even improper striking of the arc, can cause the positive carbon to overshoot the negative carbon. When this happens, the positive carbon core materials are heated back beyond the crater and the resulting internal pressure causes the molten core materials to blast out into the mirror. In some cases this blast is strong enough to cause instant breakage.

An answer to the mirror breakage problem can be found in the metal reflector which we introduced in 1934 under the trade name of H-S All-Metal Reflector. The original model was made of brass with a rhodium-plated reflective finish. This type is still in production.

Question of Light Loss

Some projectionists, however, find themselves working so close to the minimum acceptable level of screen illumination these days that they hesitate to install rhodium-type reflectors because of a possible loss, no matter how small, of screen light.

Heyer-Shultz accepted this challenge and developed an aluminized metal reflector in 1952. This new reflector gives both the drive-in and the indoor theatre the answer to the mirror breakage problem without reducing light output. In 1954 the original aluminized metal reflector was improved and reintroduced as the H-S All Aluminum Reflector. It has both an aluminum base and an aluminized reflective finish.

---

portion of the day between sunset and the time when the average child and working man must go home to bed. Its concession area, which accounts for a large part of a drive-in's profits, usually does most of its business during a break of about 15 minutes between features. Despite all these limitations the drive-in can still be a very profitable business.

A significant change in the business during the last ten years is the increased cost of building a drive-in theatre. Right after the war when the business first started to expand rapidly, a well-designed 500- or 600-car drive-in might have been erected for as little as $50,000, depending on the location and the equipment chosen. Things are different now. In an area of fairly heavy population where competition is likely, exhibitors are advised to build operations of 800- to 1000-car capacity so that they can book the latest films and generally provide services that will meet competition. A few drive-ins of 2000-car capacity have been built. Theatres of 1000-car size cost up to $300,000. Still bigger drive-ins can cost $500,000 or more. What once was a business for small exhibitors is now a major investment.

Another change in the drive-in industry has been the widespread acceptance of the idea that the drive-in needs subsidiary services such as kiddy parks for the children, and concession areas capable of serving a wide variety of foods and refreshments. A few years ago many of the older drive-in exhibitors frowned on this idea, claiming that they were motion picture exhibitors first, last and always. They also asserted that these extra services only made for profit-consuming extra overhead in the long run. Economics and public preference have proved these men wrong. Drive-in owners are now advised to expand their subsidiary services in almost any way that pleases the public.

Up until very recently it had been customary to shut down all drive-ins in the colder areas of the country for long periods during the winter. However, many drive-ins now possess the extra ramp wiring needed for the use

(*Continued on page* 32)

Gas Heaters for Drive-Ins

Infra-red outdoor gas heaters manufactured by Perfection Industries, Inc., of Cleveland, have been installed at the Post Oak Drive-In Theatres, Houston, Texas. They will service the terrace concession of this large drive-in.

The heater works on the theory of heating the object and not the air, thereby keeping the individual or object warm out-of-doors despite extremely cold temperatures.

Wage Dividend at Kodak

A record high wage dividend estimated at $32,100,000 was shared last month by employees of Eastman Kodak Co. in the U. S. About 50,900 eligible persons received $30.25 for each $1.000 they earned at Kodak during the five years 1951-55.

In The SPOTLIGHT

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

THE showings of "clips" from forthcoming Hollywood theatrical film releases was found to be highly profitable for *television* and not for the motion picture exhibition field. This startling fact was the result of a recent study by a well-known research specialist, Albert Sindlinger of Philadelphia.

Sindlinger revealed to a convention of Oklahoma theatre men that the box-office grosses of no less than 25 theatrical features were "cut by millions of dollars" due to Tv showings which were intended to boost theatre attendance. In other words, televiewers saw scenes of new movies and then decided which ones they wanted to see at their theatres.

The survey indicated that where Tv audiences were able to watch the five programs sponsored by the major Hollywood studios, which included film clips of new theatre releases, there was a 17 to 20% drop in local theatre attendance. On the other hand, in areas where none of these Tv programs was seen, box-office receipts actually increased 5 to 7%.

Regardless of what anyone thinks, presenting a dramatic scene that was designed for clear widescreen projection on a surface the size of a windowpane (even a large windowpane), is certainly not showing that scene off to its best advantage. We are of the opinion that movies shown on Tv should be especially designed for that medium.

It would be an interesting control check on Sindlinger's results if the Hollywood studios would refrain from Tv-ing film clips for a set period of time, and instead, concentrate more advertising of new motion pictures in newspapers, magazines, on radio and Tv "spots." The result in this case may be very surprising, and profitable.

• The suit for $316,500 damages filed against Chicago Local 110 by Independent Productions Corp., distributor of the controversial film "Salt of the Earth," was thrown out of Federal Court. When the distributor's attorney refused to answer the Local's query about his client's possible Communist affiliations, Federal Judge J. Samuel Perry said he had no alternative but to dismiss the case.

• The California State Fair and Exposition and the Sierra Camera Club of Sacramento announce August 29 through September 9 as the dates for the Sixteenth North American International Photographic Exhibit. Closing date for entries of prints is July 27, and for slides, August 9. Entry blanks may be obtained from the California State Fair and Exposition, P. O. Box 2036, Sacramento, Calif.

• Alfred J. Antoinette succeeded Edward E. Wendt as business representative for Local 324, Albany, N. Y. Wendt recently resigned because of outside business interests.

• According to reports reaching this corner, New York Local 306 has joined the campaign to boycott the showing of the Gannaway-Verhalen feature "Daniel Boone," which was produced in Mexico without American technicians and under non-union conditions. Since the locale of this film is in the state of Kentucky, it is obvious that the reason for making the picture outside of this country was for the purpose of avoiding paying recog-

PROJECTION IN TOLEDO



Local 228, Todelo, Ohio officials—H. R. Feehrmeyer (left), recording-secretary, and Harold Sheats, secretary—at their posts in the projection room of the Paramount Theatre there where they are employed.

SAN FRANCISCO LOCAL 162 SIGNS NEW WELFARE PLAN



Representatives of San Francisco Local 162 and the employers' group are shown signing the agreement. Sitting, left to right are: Paul Williams, chairman, United California Theatres; Rexford Elder, Local 162 trustee and administrator of the Fund. Standing: Charles F. Mell, California Physicians' Service (CPS) representative; Ben Levin, General Theatrical Co.; A. B. Cohn, president, Local 162; Wm. Lingle, Local 162 secretary-treasurer; and Earl W. Long, city manager for Paramount Theatres.

Man Bites Dog?

A California Court has ordered the head of a building repair firm to pay the men who are picketing his own repair job. Superior Court Judge Taylor, of Contra Costa, ruled that Henry Brodsky, whose Walnut Creek apartment house-motel repair job has been picketed by the Contra Costa Labor Council since May 1954, did not live up to an agreement he signed in 1950 to employ only union labor. Violation of the agreement forced the Central Labor Council to picket the job, and since pickets have to be paid a reasonable wage, Brodsky must pay them. He was ordered to pay $3,489 for the picketing of his job since May of last year.

nized American standard of living wages.

Steve D'Inzillo, business representative for Local 306, described the membership as being "up in arms" about the production in Mexico by American producers of a film about an historic American figure, particularly when the picture obviously was meant for showing in movie houses throughout the United States.

• A one-year contract signed by Local 407, San Antonio, Texas and the Statewide Drive-In Theatre Corp., marked the end of a bitter nine-month strike by the Local against the Rigsby, Mission, Alamo, and South Loop 13 drive-ins, all under Statewide management. The projection rooms of these ozoners are now manned by Local 407 members. Durward A. Taylor, represented the San Antonio Local at the negotiations.

• The New York State Assn. of Motion Picture Projectionists will hold its 1956 Spring meeting in Binghamton, N. Y., on Monday, May 7, at 2 p.m. The meeting will take place at the American Legion Post No. 80, located at 76 Main Street. Earl Tuttle, business representative for Local 396, Binghamton, is in charge of arrangements.

• George Thrift, secretary for many years of Local 348, Vancouver, B. C., resigned from office and has been succeeded by Don Wilson. Thrift has taken a post with an engineering organization in Vancouver.

• Two of Local 314, Schenectady, N. Y. top officials are on the sick list. John Sauerborn, president, suffered two strokes and has been confined to his home for some time. And Edward O'Donnell, financial-secretary of the Local, took leave of absence from Proctors Theatre in Schenectady, where he is employed, to recuperate from a recent illness. We wish them both speedy recoveries.

• Charles F. Wheeler, secretary-treasurer for Local 108, Geneva, N. Y., was re-elected to office for the 24th consecutive term, a record of which he is rightfully proud.

• The Tristate Association, comprised of IA Locals in the states of Pennsylvania, Ohio, and W. Virginia, will hold its next—32nd—annual convention at Eagle's Hall, DuBois, Penna., on June 3 next.

• Albany (N. Y.) Local 324 scored a victory in signing up the Royal and Paramount Theatres there for one-year contracts. The Paramount had been picketed by the Local since it reopened May 29, 1955 as a non-union house, and the Royal also got the picket treatment when it took down its shutters, so to speak, last January. Picket lines were in operation at both houses even in 20 degree below weather. Mr. Jules Permutter, the exhibitor, finally threw in the sponge and signed a contract calling for two-man projection operation for both theatres at the prevailing rate for neighborhood houses.

• Back in 1949 we were visited by one of our overseas friends—Frank Robbins, secretary of Dublin Branch No. 7, Theatres and Cinemas, of the Irish Transport & General Workers' Union. A letter recently received from Mr. Robbins reminded us of that visit and told us some very interesting facts about the members of his organization.

Branch No. 7—Theatres and Cinemas—was founded in 1917 and has a membership of 1700, representing every phase of show business—projectionists, doormen, ushers, cashiers, dance troupes, etc. Mr. Robbins also informed us that there has been only one theatre strike in Dublin since 1922. As an example of the good relations existing today between theatre owners and their employes, he mentioned a benevolent fund in which both groups are jointly interested. At the present time, about 40 members of the Branch are receiving monthly aid from the fund.

Gold medals have been awarded to the three members who founded this Branch —Bob Tait, chief projectionist at the Savoy Theatre in Dublin; Paddy Fitzsimons, night watchman at the Savoy, and Paddy Murtagh of the Theatre Royal.

PROJECTIONIST FROM OVERSEAS



Bob Tait, projectionist at the Savoy Theatre in Dublin, Ireland.

COMMITTEE OF DUBLIN THEATRES AND CINEMAS BRANCH NO. 7



Shown here are committee members of Theatres and Cinemas Branch No. 7 of the Irish Transport and General Workers' union. This Branch, with its headquarters in Dublin, Ireland, has a membership of 1700, which includes every employe in the theatre—doormen, ushers, projectionists, musicians, etc. Seated, left to right: F. Matthews, trustee; Anne McCrane; F. O'Toole, vice-president; Frank Robbins, secretary; and P. Quigley, trustee. Standing: Joe Cunneen; Clem Roberts; Bob Crawford; Tom Canavan; P. O'Brien; Gerry Campbell, trustee.

Long throws will limit the speed of the lens to be employed in illuminating a large drive-in screen.

Drive-In Projection Lenses

By J. A. FETHERSTON
Kollmargen Optical Company



Most modern lens in the Kollmorgen line, the Super Snaplite *f*/1.7

THE FOCAL LENGTH and type of prime lenses required by drive-ins depends on (a) picture size, (b) projection distance, (c) diameter of lens holder, and (d) type of projection, regular or anamorphic.

The present-day trend in picture width for drive-ins seems to vary from 60 feet to 120 feet. To project such wide pictures requires that the projection lens be the fastest that can possibly be obtained. In finding a faster lens we are limited by the size of the lens holder on the projector. For instance, the fastest lens possible using the old standard lens holder of 2.781 inches diameter in a focal length of 7 inches is *f*/2.8. If, however, the lamp holder is one of the newer 4-inch type, the speed of the 7-inch focal length lens can be *f*/1.9.

Since the amount of light that a lens is capable of passing varies as the square of the speed, the ratio in favor of the *f*/1.9 lens will be as 7.80 is to 3.60.

Long Projection Throws

This 7-inch focal length, *f*/1.9 lens will project a 100-foot-wide picture in standard, non-anamorphic projection at a distance of about 850 feet; with anamorphic projection and an optical-sound print, the same size picture and the same lens will require a throw of 420 feet. With a magnetic anamorphic print the throw will be 390 feet.

Although theoretically the amount of light on the screen will be about the same for both standard an anamorphic projection, the great increase in projection distance in the case of standard projection will probably cut down the light due to atmospheric and local con-

(*Continued on next page*)

TO PROJECT PICTURE 100 FEET WIDE

Type of Lens Super Snaplite	Barrel Diameter	*F.*	*F.*²	Focal Length E. F.	Projection Distance (Approx.) Regular Projection Aperture .800 x .625	Anamorphic Projection Magnetic Sound Aperture .912 x .715	Anamorphic Projection Optical Sound Aperture .839 x .715
BX–265	4.0	1.9	3.61	7.0"	850'	385'	415'
BX–265	4.0	1.9	3.61	6.0"	730'	330'	355'
BX–265	4.0	1.9	3.61	5.0"	610'	275'	300'
BX–290	2.781	1.7	2.89	4.0"	485'	220'	240'
BX–290	2.781	1.7	2.89	3.0"	365'	165'	180'
BX–294	2.781	1.7	2.89	2.0"	245'	110'	120'

The solution of the problem of projecting approximately the same size picture, from a given projection distance, using regular and anamorphic apertures, probably lies in using short focal length lenses for regular projection and longer ones for anamorphic. But in both instances the lenses should be the fastest possible to make use of all available light coming from the positive crater.

The Ole Cranktwister

Our cantankerous Detroit correspondent writes to claim he is being eaten alive by magnetic maggots. We caution our readers that the following opinions are his alone.

ONCT upon a time there was a king called Midas, and it is said that besides bein a king he was a big time magician. Before a stupefied audience he would touch somethin and, presto, it changed into solid gold. If no mirrors was used, I kin see where the act rated top billin even for them olden days.

Howsoever, I got a magician who resides in my H. I. lamphouse that goes Midas one better. Unlike Midas this guy dont have to touch the object. Just bring the object near and — presto again—it goes magnetic. "P.M." is what we call him and his initials dont refer to "pleasant moments" either. They mean *positive misery* with everything in the booth going magnetic.

Along about the time magnetic reproduction came out we got smooth-talkin pontifical nonesence writ by Hollywood studio projection experts on how to make magnetism do the disappearin act. De-gaussin they calls it. Now the proper *modus operendi,* they say, is to sweep out the magnetic varmints onct per day with the de-gaussin gun. Even Ole Twister fell for that one until one day he decides to check up on his de-gaussin efforts one hour afterwards.

Result? Not since the St. Louie World's Fair when a slicker sold him a "hot" watch was the Twister's confidence so shaken. A magnetic test showed that, during that one hour, P.M. had replenished a clean projector head with 10^{10} new magnetic termites which was crawlin all over the head.

Test any projector head with P.M. in residence in the lamp and you will find that the head possesses a perimiment North and South magnetic pole. The studio experts to the contrary notwithstanding. How can it be otherwise with the main frame magnetically coupled and the shafts of ferrous metal? With a cesspool in the H.I. lamp breedin magnetic maggots as fast as the projectionist can de-gauss, you might just as well try sweeping the water out of the ocean with a broom.

A Ray of Hope?

But a ray of hope appears to dispel the gloom. One of our local lads—Stubby Shorttrim—seems to be on the right track to a solution of the vexing problem. Stubby theorizes that if a magnetic force is set up in the head which is equal but opposed to that of the arc corrector, one set of magnetic varmints will cancel off t'other set.

To put theory into exequeshun he has rigged up what he calls a anti-demagnetizer lasso, which consists of a long extension wire in series with the arc circuit. With proper regard to polarity, a couple of turns of said extension wire is then wrapped around the head. The moment Stubby strikes the arc it's gladdening the way them magnetic microbes scram outa there.

Of course the same effect could be produced by a counter acting P.M. of the same magneto motive force. But Shorttrim distained the suggestion declarin it to be fly brain because of its simplicity. Some guys always insist on the hard way.

A distressin side issue, however, has resulted from this great boom to projectionists. Ever since Stubby installed his anti-demagnetizer he has been having just one argument after another with his service man. It seems that the patrons of his theatre have been complainin to the boss, and the boss has been complainin to Stubby, and Stubby has been complainin to the service man about certain weird noises of a transient nature in the sound system. Instead of gettin to work and findin out what's causin the noises, this service man is one of those buck passers.

He makes the ridiculous claim that the noises is due to the "Bees," and just because the bees happened to arrive the very day that the anti-demagnetizer lasso was installed, he keeps mumbling outlandish nonesence about cause and effect. This ignorance dont recoginze coincidence when it's plain as an arc burnin upside down.

There aint nothin those pesky magnetic demons wont attach themselves to T'other night I was wheelin back and forth across the booth—just killin time till the "good night" slide. The compass detector was layin on the bench and I couldn't help but notice strange gyrations of the needle. Every time I wheeled back and forth that compass needle kept pointin right at *me.* That shameless P.M. even lacked the decency to spare my wheel chair! It took me the best part of an hour to thoroly delouse it, and furthermore, that hour is goin in as overtime.

Does anybody happen to know where a feller kin buy a brass wheel chair?

FRANK W. MACDONALD

Local 199, Detroit, Mich.

(*Continued from preceding page*)

ditions such as dust, mist, fog and rain.

To reduce this interference it is wise to use a 3.25-inch focal length. *f*/1.7 lens at 390 feet when projecting pictures with regular prints. The ratio of light on the screen will then favor the *f*/1.7 lens in a ratio of 3.60 to 2.90.

The *f*/1.9, four-inch diameter lens in the 7-inch focal length has been used in the above illustration because it is the fastest lens possible under these conditions. Above 7-inch focal length the speed of the lens will decrease.

In standard barrel, 2.781-inch diameter lenses, the maximum focal length in *f*/2 speed is 5 inches. In *f*/1.9 speed, the limit is 4.75 inches focal length, and in *f*/1.7 the limit is 4 inches.

The accompanying table shows why it is important to use shorter focal length lenses for regular projection and longer focal lengths for anamorphic projection of either magnetic- or optical-sound prints.

National Carbon Wins "Oscar"

The Academy of Motion Picture Arts and Sciences awarded one of its coveted "Oscars" to the National Carbon Co. for its contribution to the art of studio lighting. The bronze statuette—the only one presented this year for scientific and technical achievement—was in recognition of National Carbon's development and production of the yellow flame carbon for motion picture color photography.

A product of several years research, the yellow flame carbon was first used extensively last year. Operating at a color temperature of 3350 degrees K., it eliminates the need for heavy filters to provide a white light source balanced to the color characteristics of motion picture color film, thereby achieving an increase of light output of more than 60% with the same electrical power.

If the surface is not properly maintained, this will be a complicated and expensive procedure.

Painting the Drive-In Screen

By LEONARD SATZ
Raytone Screen Corp.

REPORTS are trickling in from many areas of the country telling of the difficulty in maintaining drive-in screens in good condition. Peeling and scaling of newly-painted surfaces is quite common. Screens must now be painted each season without fail, while earlier in the life of the screen a good paint job was able to last two years without trouble. A careful examination of the facts involved will reveal a great deal about why a surface is more difficult to maintain as it grows older.

Firstly, drive-ins require a good projection surface that will stand up against the elements. Sun, wind, rain, extremes of temperature—all take their toll. A great offender is dew or other types of condensation such as sweating at night when the temperature drops suddenly after a warm, moist day.

Good projection practice requires a certain kind of white and a flat diffusive finish. Good weathering qualities require either an oily or an enamel base which is not proper for projected images. The trick, then, is to compound a paint that is flat and diffusive, has the proper kind of white pigment, and which will stand up under the elements.

Secondly, we must assume that in order to get good results with any paint used outdoors—whether it be screen paint, yacht paint or house paint —good painting practice is a prime requisite. Unfortunately, in too many cases years go by and one paint job after another is put on with a complete disregard for recommended practice. It is proposed that some of the excellent suggested painting techniques put out in printed form by paint manufacturers be examined carefully by drive-in operators. Of special interest are the recommendations of manufacturers of yachting paints.

Basically, the first requirement for a lasting paint job is proper preparation of the surface. When new, most surfaces used on drive-in screens require little preparation. Exceptions are marine plywood, galvanized iron and aluminum. Once paint has been applied to a surface the manufacturer does not assume responsibility for subsequent coats of paint, nor will he assume responsibility for the prime and new coats unless the work is performed by his technicians.

The reason is obvious. The paint will probably meet every test in the laboratory, but the surface may not have been properly prepared and the technique of application may not have been correct. Since the surface to be prepared is tremendous in area and the human element is involved and since we must always consider the cost aspect we are often negligent.

Unavoidable High Prices

Reliable painting contractors know of the problem but cannot get a high enough price for their work because, if it is done according to recommended practice, so much additional time is required that the cost does, in fact, become extremely high. Scaffolding is involved and time is of the essence since the show must go on. Sandpapering, scraping, washing, a minimum of two coats, and other prerequisites are conveniently forgotten.

On new surfaces little trouble is experienced. Extended surfaces for CinemaScope have given little trouble; but the old surface at the center of the screen peels. Why?

Revolution—
Pizza Tops Frankfurter

Pizza pies, the Italian delicacy, are replacing hot dogs, the standard American snack, as the leading food item in drive-ins. Frankfurters, meanwhile, are moving indoors as more and more conventional theatres are installing hot dog dispensing equipment.

The extent to which pizza pies are replacing hot dogs at drive-ins was demonstrated at the concession trade show of the recent Allied States exhibitor convention in Chicago which featured more pizza-making machines than frankfurter heaters.

What would happen on a boat if each Spring an old surface were not carefully sanded and scraped and then given two and sometimes three coats of good paint? What would happen if, after six or seven years of paint application, the old built-up surfaces were not burned off or otherwise removed? The answer is obvious. Paint would peel and give unsatisfactory service.

Then why does the owner of a drive-in theatre expect good results year after year when the usual treatment is one coat of paint over old coats that were single coats to begin with? A single coat of paint applied over a chalky, cracked, alligatored or blistered surface not only will not adhere well but hasn't enough "guts" to weather the storm. It will disintegrate just enough in one year to make a poor surface for the next coat. As time goes on a thick coating of badly weathered paint builds up. The only remedy being, in time, complete removal of the paint and starting from scratch. Otherwise, the screen will peel in spots, and even if scraped in the Spring, will continue to peel in other spots. It is an endless chain. When such a condition prevails, money and time will be saved by removing all old paint and starting from scratch with two-coat jobs.

If in doubt, let a simple test be made with test shingles of the same material as the screen surface. Let them hang on the back of the tower and it will be noted that a two-coat job never disintegrates as quickly or as completely as a single coat. Furthermore, there is no substitute for proper preparation of the surface, regardless of the type of paint to be used.

Plywood screens require an outdoor plywood sealer to stop absorbtion of paint into the soft grain of the wood. Galvanized surfaces require "pickling" with vinegar, flushing with water, and priming with zinc chromate primer. Aluminum screens require pickling or etching with a phosphoric acid preparation, or equivalent, before painting. In each case, two coats of good paint should follow. Transite or other asbestos-cement surfaces may or may not require prime coats, depending upon the manufacturer's recommendations.

In conclusion I say again that the drive-in projectionist would do well to read up on good painting techniques so that he may intelligently discuss the next painting job with the exhibitor and painting contractor.

OBITUARIES

KUMMER, GEORGE, member of Local 165, Hollywood, Calif., died several weeks ago following an accident at his home. He slipped on the front porch, striking his head, failing to regain consciousness. A member of the Local since 1939, Kummer worked in the experimental projection room on stage 17 of the Paramount lot. He was a member of the Paramount projection crew for the past 23 years and had, at one time or another, worked in every projection room on the lot. Survivors are his wife and two children.

• • •

CLARK, HARRY, charter member of Local 154, Seattle, Wash., died March 5. Clark joined Local 154 on September 1, 1908, and played an active role in union affairs. He worked at the Blue Mouse Theatre in Seattle for several years, until ill health forced his retirement last year. In 1952 he was presented with a gold honorary life membership card in recognition of his many services to the Local.

• • •

EDINGER, HAROLD, 56, member of Los Angeles Local 150, died suddenly on February 26. A member of the Los Angeles Local since 1929, Edinger was extremely popular with the membership. He was a projectionist at the Southern Calif. Race Track, a position he held for the past five years.

• • •

HAYWOOD, HOLLIE L., charter member of Local 165, Hollywood, Calif., died recently after a lingering illness. He worked with the projection crew at the M-G-M Studios in Culver City for many years prior to his illness.

• • •

LEVY, LOUIS, 79, retired member of Local 277, Bridgeport, Conn., died recently on an Eastern Airlines plane on a return flight from Miami. He was returning to his home in Milford, Conn., from a Florida vacation, and was stricken with a heart attack while the plane was en route.

• • •

SMITH, RALPH WESLEY, 53, member of Local 154, Seattle, Wash., died last month. He worked in the projection room of the Roosevelt Theatre in Seattle from 1948 to 1954, when he retired because of failing health. He is survived by his wife, parents, and a brother.

• • •

BATEMAN, ARTHUR, 62, member of Ottawa, Ont., Canada Local 257, died recently after a lingering illness. A former official of the Local, he had been employed at the Imperial and Rialto Theatres in Ottawa. Survivors are his wife, a son, and two daughters.

• • •

SERVIS, FRANK F., 47, member of Local 324, Albany, N. Y., died suddenly on February 27. He had been employed at Fabian's Mohawk Drive-In Theatre since its opening in 1946. Servis was a veteran of World War II, having served in the U.S. Navy.

SUPER SNAPLITE
f/1.7
and
SUPER SNAPLITE
f/1.7X

(True speed of f/1.7 in all sizes where fast lenses are needed)

NOW . . . FINER LENSES FOR FINER MOTION PICTURES



From Kollmorgen . . . the newest, fastest projection lenses you can buy. To give you the brightest, clearest, sharpest, most uniform picture you have ever seen on your screen. For better Boxoffice, better patron satisfaction, better all around filming, try the SUPER SNAPLITE f/1.7. Where lens mount interferes and vignetting is a problem, try the SUPER SNAPLITE f/1.7X.

True speed of f/1.7 in focal lengths from 2 inches through 4 inches in ¼ inch steps. Ask your Theatre Supply Dealer about these fine lenses. For more information ask your dealer or write for Bulletin 222.

KOLLMORGEN Optical CORPORATION
Plant: 347 King Street
Northampton, Massachusetts
NEW YORK OFFICE: 30 CHURCH STREET, NEW YORK 7, N. Y.

Considerable ramp space saved by means of arrangement which halves the required focal length of prime lens.

Reverse CinemaScope Lens for Drive-ins

By BOB DENEEN
Bausch & Lomb Optical Company

TEXAS, the land of the wide-open spaces, has built some of the nation's most spacious drive-in theatres. The chief problem the Texans had to cope with was the long projection throw needed when laying out a large drive-in.

The bottleneck was broken in 1954 when the Scientific Bureau of the Bausch & Lomb Optical Co. developed a technique of doubling the throw-distance of CinemaScope lenses. At the time, we considered the lens innovation a temporary emergency measure—but the system has worked so well that it has become standard practice. We call it the Reverse CinemaScope lens because the CinemaScope element is used in reverse position.

One of the first theatres to install the equipment was the Joy Drive-in Theatre in Waco, Texas, which was able to place its projection room 542 feet from the screen. Since then, even longer distances have been realized. A 627-foot projection distance is being used by the Crest Drive-in Theatre in Kansas City, Mo. But Texas remains the title holder. The Hardin Theatre Supply Co., of Dallas reports selling a Reverse CinemaScope lens system that permits a throw-distance of 667 feet the longest on record.

More Ramp Space

Why did the throw-distance of lenses become such a nightmare? The reason is simple. Exhibitors wanted more spectator space. This was the seemingly impossible problem that faced two Texans, C. A. Richter and Leon Newman, owners of the Corpus Drive-in Theatre in Corpus Christi when they decided to do a remodeling job on their theatre.

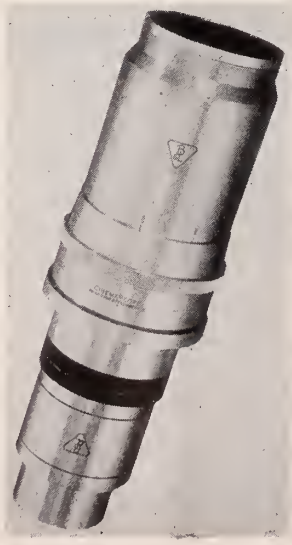
Their prospective plans called for a wider screen, a larger concession stand and more car space. The stumbling block was where to put the new projection room to insure complete picture coverage of the bigger screen.

Its original location was 225 feet from the screen, but it would have to be moved much farther back if the image was to fill the large new 41 x 82-foot screen. Somewhere about midway in the parking area was the logical spot from an equipment standpoint. That, of course, was impractical because of the number of cars it would prohibit from viewing the picture.

The owners finally decided on locating the projection room all the way at the back of the ramp area. This would allow added parking space, but was it possible? The projection distance from the rear of the lot would be over 640 feet, a terrific distance. Could equipment be found for such a throw?

Richter and Newman took their problem to Alec McKenzie of the Southwestern Theatre Equipment Co. McKenzie said it was "impossible." But knowing the men were not to be dissuaded when they made up their minds, he promised to see what could be done. He contacted Bausch & Lomb and took up the problem with our lens design experts.

The result is past history now. The Corpus Drive-in Theatre now has its projection room at the rear of the parking lot with a Bausch & Lomb Reversed CinemaScope lens. The lens system projects the picture 646½ feet to the wide-screen with a sharp, clear image. The lens is 18 inches long and four inches in diameter, and has a speed of *f*/1.8.



The B & L Reversed CinemaScope lens for drive-ins. Required focal length of prime lens is halved by combining it with C'Scope attachment in reverse position.

When this situation and others like it were turned over to the Bausch & Lomb Scientific Bureau, the company realized that it had a serious challenge. What was wanted was longer projection throws—more than double the former distances and yet, be within the practical dollars and cents limits of theatre owners' budgets.

B&L knew that longer throws without loss of light, speed and picture image would require king-sized prime and CinemaScope lenses of monumental cost. Further, these enormous theoretical lenses would require alteration of projector heads.

Practical and Economical

Knowing this was not economically sound, we sought to develop a lens system that would not only be practical, but would cost little more than present models being used.

The answer was the ingenious Reverse CinemaScope lens system, which is the modified B&L 4-inch diameter CinemaScope attachment. This permits the use of standard prime lens of exactly one-half the focal length normally required—a 4-inch instead of an 8-inch, a 5-inch instead of a 10-inch, etc., with only a slight factory alteration at a nominal cost. Adapters are furnished to take either 2-25/32-inch diameter or 4-inch diameter Super Cinephor prime lenses.

At present, many exhibitors considering new drive-ins or remodeling their present ones are checking their plans with us before going ahead with construction. This enables us to recommend the exact projection distance that would be most advantageous for their particular installation.

Wide-Gauge C'Scope Delay

According to Spyros P. Skouras, president of 20th-Fox, plans for releasing "The King and I" for 55-mm projection roadshows in the Fall have been changed, and the picture will now be distributed for theatrical exhibition in 35-mm CinemaScope this July. "The Greatest Story Ever Told," which is still in production and is expected to take another two years to complete, is now scheduled to be the first picture to be released for theatrical exhibition using 55-mm CinemaScope for projection. Present plans at 20th-Fox call for four pictures a year to be filmed in 55-mm CinemaScope and then reduced to 35-mm for theatrical projection.

I A ELECTIONS

LOCAL 108, GENEVA, N. Y.

Emerson Garling, *pres.;* Arthur Gardner, *vice-pres.;* Charles F. Wheeler, *sec.-treas.;* E. Garling, *bus. rep.;* William Baroody, *one-year trustee;* E. Garling, *del. State and National Conventions.*

LOCAL 433, DAVENPORT (IOWA), ROCK ISLAND AND MOLINE, ILL.

Edward A. Short, *pres.;* Richard T. Murphy, *vice-pres.;* George A. Stoddard, *rec.-sec.;* Fred R. Mauck, *fin.-sec.;* Lloyd Burrs, *treas.;* Fred R. Parker, *bus. rep.;* George Hauner, *sgt.-at-arms;* E. Short, R. Murphy, G. A. Stoddard, F. Mauck, F. Parker, *exec. board;* Kenneth L. Benedict, Paul E. Short, Peter M. Jezewski, *trustees;* Kenneth L. Horton, *del. IA Convention;* R. T. Murphy, *del. Iowa State Ass'n;* G. A. Stoddard, *del. Illinois State Conference;* G. Stoddard, F. Parker, Roy L. Blugaugh, *del. Tri-City Fed. of Labor.*

SMPTE Equipment Exhibit

A large trade exhibit comprised of over 32 booths of the latest motion picture and TV equipment will be part of the 79th semi-annual convention of the Society of Motion Picture and Television Engineers to be held April 30-May 4 at the Hotel Statler in New York City. Some of the featured items on display will be film processing and editing machines, motion picture projectors and high-speed cameras, a wide variety of lenses, sound and animation equipment, and TV color cameras and projectors.

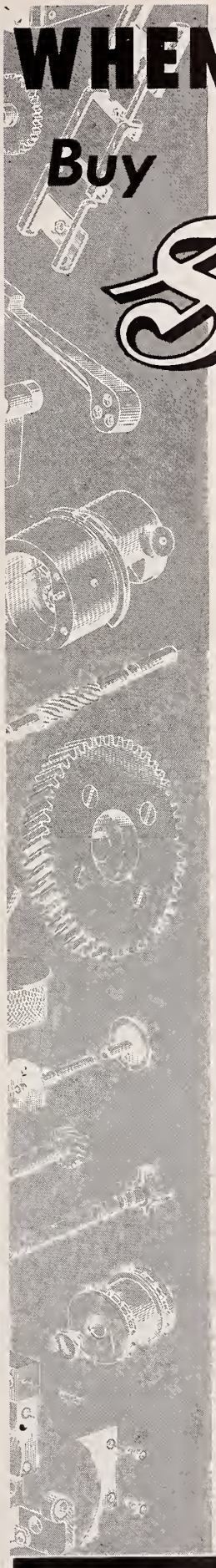
A total of sixteen technical sessions have been scheduled embracing such topics as motion picture projection, laboratory practice, film production, TV studio lighting, high-speed photography and theatre screen brightness. Also scheduled is a special showing of "Oklahoma" in Todd-AO at the Rivoli Theatre. The Association of Cinema Laboratories will also meet during SMPTE convention week.

A run-down of manufacturers who will display and demonstrate their products in the booths include Bell & Howell, Camera Equipment, General Precision Laboratories, Neumade Products, RCA, S.O.S. Cinema Supply, Strong Electric, and Westrex.

Todd-AO Camera 80 miles Up

"Around the World in Eighty Days," Michael Todd's newest Todd-AO feature now in production will include a sequence of shots taken 80 miles above the earth by a camera attached to a guided missile.

The spectacular sequence was made recently at the White Sands proving grounds in New Mexico.



WHEN YOU BUY...

Buy Simplex

T.M. REG. U. S. PAT. OFF.

Your SIMPLEX Projector Mechanism represents a priceless investment. You bought it after long, careful study because you recognized it as the finest projector on the market.

Don't take chances with such an investment — *the very success of your theatre* depends upon its performance! When spare parts are necessary, insist on the best — insist on *SIMPLEX* parts!

From the smallest stud pin to the largest gear cover, every part is made with the same precision and skill as the mechanism itself. By using *only* SIMPLEX parts, you can be certain of maintaining the high quality of performance that has made SIMPLEX the world's foremost projector mechanism!

Genuine SIMPLEX parts are available only through

N.T.S.

Your Guarantee

of Consistent Quality and Outstanding Service

NATIONAL THEATRE SUPPLY • 29 BRANCHES COAST-TO-COAST

DRIVE-IN PROJECTION REQUIREMENTS

(*Continued from page* 17)

phic lens supporting shaft is adjustable and can be lowered or raised as required to obtain proper support for the lenses. When correctly adjusted. the anamorphic-projection lens combination can be slid in and out of the unlocked lens holder by rotating the support roller located on top of the anamorphic lens supporting bracket.

If your XL mechanism has been in use for say, a year, it is a good idea to examine the film trap for proper lateral guide roller adjustment which, in turn, can mean a steadier picture. This can be done by removing the film trap and examining the setting on the fixed lateral guide roller (nearest the operator) with the aid of a straight edge held tightly against the roller and the film guide.

The fixed lateral guide roller is correctly positioned when it just bears against the straight edge. Should an adjustment be required it is only necessary to loosen the set screw located underneath the film trap directly behind the lateral guide roller and then slide the guide roller pivot pin to achieve the correct setting. The pivot on the opposite side of the film trap should then be adjusted to provide minimum play consistent with free rotation of the guide roller assembly.

Check Pressure Pads

The pressure pads and intermittent sprocket shoes on the film gate also play an important role in providing a steady picture. Replacement should be made if an examination reveals that the pads or shoes are worn or grooved.

Since all metal gears and rotating shafts of the XL are hardened or made from high-strength steels to ensure long life (Fig. 3), and all rotating parts are continuously sprayed with a bath of oil assuring positive lubrication, no maintenance is necessary other than an oil change two of three times a year.

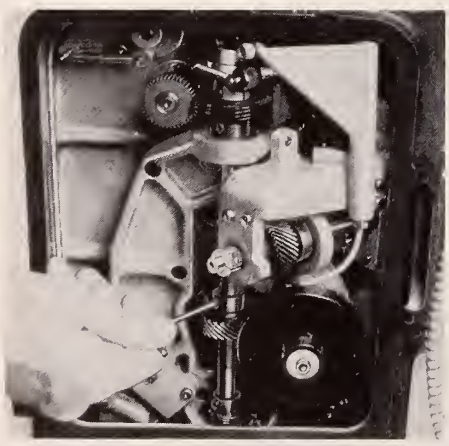


FIG. 3. Gear compartment side of the Simplex XL.

To drain the oil compartment, remove the drain plug from the oil gauge. When the oil compartment is drained, dry both the plug and plug hole. Before replacing the drain plug, apply to the threads a small amount of non-hardening gasket sealer. Simplex oil should then be added by pouring through the opening surrounding the shutter adjusting knob on top of the projector. Sufficient oil has been added when a continuous spray is observed during operation, however, care should be taken not to fill the oil compartment above the level of the main drive shaft or oil will leak from this point.

Intermittent Lubrication

Oil for constant pressure lubrication of the intermittent movement is also supplied by the pump in the gear compartment, therefore, no additional maintenance is required for the "heart" of the projector.

All XL mechanisms shipped from the factory since December 1953 (serial number 6001 onwards), have been equipped with narrow tooth sprockets, nylon pad rollers and other new parts thus permitting the use of both regular and CinemaScope prints. Conversion kits are available for mechanisms made prior to this date.

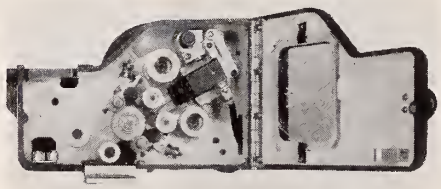


FIG. 4. Simplex XL magnetic soundhead.

Since the introduction of sound we have referred to this equipment as a "sound system." As in the case of the arclamp, projector and lens, it is of the utmost importance that the sound components be properly matched so that they will function as a *system.* The addition of equipment for reproducing sound from magnetic tracks has complicated the sound equipment, but it is still necessary to consider this equipment as a complete "sound system." The latest Simplex sound equipment for drive-in theatres is a completely integrated single-channel optical magnetic system; a single control cabinet at each projector station contains a changeover button, volume control and an optical/magnetic selector switch. Both the installation and operation of this equipment is simple and "error proof." Separate high frequency balancing networks are provided so that the system response can be adjusted for both magnetic and regular optical sound. Your existing "optical-only" sound system can be modernized by the addition of Simplex magnetic soundheads and control equipment.

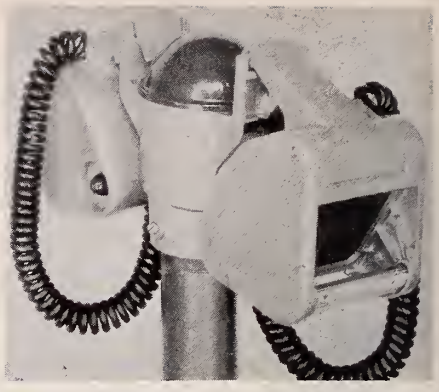


FIG. 5. Simplex in-a-car speaker with built-in handle, two-step hanger and recessed volume control.

The Simplex XL magnetic soundhead (Fig. 4) is a tight loop film driven unit with few moving parts. Very little mechanical maintenance is required, however, surfaces which come in contact with the film, especially in the picture area, should be kept free of all foreign matter. Pad rollers, guide rollers, tension rollers, sprockets and drums should rotate freely with no indication of stickiness.

Damping of Lower Roller

To provide flutter free sound, the lower tension roller is silicone oil damped. Since this design requires no arms or linkages, no attention need be paid to adjusting for such flutter introducing factors as backlash or end-play. The viscosity of the silicon oil used for damping the lower tension roller is such that leakage will be practically non-existent. An occasional check for proper damping is in order, however, and is done by pushing the lower tension roller up and down. A definite drag indicates that the oil level is correct. Should no damping be evident, it is recommended that a service man be called to check the lower tension roller assembly.

During operation, the two tension roller arms should be separated one-eighth inch to one-quarter inch and the rollers should ride midway be-

tween the upper and lower drums. If the tension rollers are not in this position, loosen the locking screw located in the lower right hand corner of the soundhead approximately one-quarter turn and then rotate the adjusting screw (located below the locking screw) until the tension rollers are in their proper position. This adjustment must be made with film running. Tighten the locking screw when the adjustment is completed.

Any steel part that is magnetized and comes in contact with magnetic sound tracks will cause deterioration of both sound quality and level. To help prevent the possibility of such damage, Simplex XL projection equipment is thoroughly demagnetized prior to shipment from the factory. During installation, projection equipment once again undergoes demagnetization. Under normal operating conditions, parts which have been demagnetized will not again become magnetized, however, it is a good plan to check periodically all steel parts that come in contact with magnetic sound tracks. A small jeweler's compass can be used for this purpose. If it is suspected that a part has become magnetized, one of the commercially available degaussers can be used to demagnetize the part. In some places—particularly on the trap and gate—it may be necessary to remove the magnetized parts in order to perform this operation effectively.

Condition of Speakers

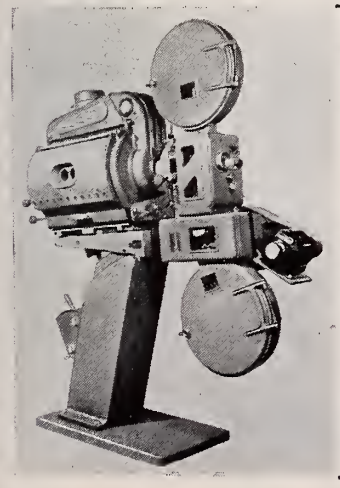
Last but not least in the sound system is the in-a-car Speaker itself. We may have the finest magnetic soundhead and new amplifiers but the quality of the sound delivered to the customers will still depend on the condition of the speakers. The physical condition of the speaker units should be checked regularly; any looseness or dirt within the enclosure may cause rattling or "rough sound."

After one or more seasons in the field the speaker cones may be damaged or warped. Volume controls may be worn out or require special lubrication. Frayed or damaged cords will result in intermittent, unreliable operation. If the general condition of speakers in the theatre is poor it may be well to consider replacement with complete new speakers rather than individual repairs. The Simplex in-a-car Speaker (Fig. 5) is a particularly rugged unit designed especially to stand up to the kind of service required for drive-in theatre use. To encourage replacement of the speaker unit on the junction box, a convenient handle is included in the speaker enclosure. The speaker itself is located within the case by means of a spring; this helps to prevent distortion when the speaker is dropped and simplifies maintenance.

In this article I have endeavored to show how both picture and sound are reproduced by the use of a chain of major components; the quality of both is dependent upon the condition of each link in the chain. Proper maintenance of the picture and sound components and replacement of any obsolete components is necessary to ensure the kind of quality which will keep the public coming back for more.

New Consolidated Lab Opens

A modern 30,000 square foot film processing laboratory, under the direction of Douglas T. Yates, Consolidated Film Industries, began operations recently in New York City. This new plant by Consolidated is electronically controlled and will be among the first laboratories of its kind to use the Sylvania RF lamp.



WENZEL presents the finest equipment (except arc lamps) that 35 years of designing have produced. Now in use in many large theatres all over the WORLD!

CINEMASCOPE (FOX HOLE) SPROCKETS FOR ALMOST ANY TYPE PROJECTOR OR SOUND HEAD

Increase your screen illumination without increasing your amperage. New instantly adjustable shutter for use on Wenzel, Ballantyne, Century, Regular and Super Simplex Projectors.



STANDARD THEATRE: S 796 RS-3 DRIVE-INS: 2033 BR-6

Send for Literature

WENZEL PROJECTOR CO.

2505-19 S. State St. • Chicago 16, Ill.



Super-Hilux®

THE PROJECTION LENS with GREATEST OVER-ALL INCREASE IN LIGHT TRANSMISSION

F:1.0 LIGHT COLLECTING SPEED

1 year in service . . . proven in hundreds of theaters!

1st to present an entirely new concept of theater projection!

1st to be designed with emphasis on acutance!

1st to be chosen by leading DRIVE-INS and THEATERS.

Four reasons why a Super-Hilux should be *1st* on your list of "Musts." Write for comparison tests and focal length computer to Dept. P-4

PROJECTION OPTICS

PROJECTION OPTICS CO., INC.
330 Lyell Ave., Rochester 6, N. Y.

Fire Safety for the Drive-In Theatre

While the danger of fire is much less for the drive-in than for the indoor theatre, proper precautions should be taken with the same amount of painstaking care. Fires are not unknown to drive-ins. Though they occur relatively infrequently, fires have left proof at many outdoor theatres that they are capable of destroying both life and property. Moreover, the nature of the drive-in operation presents a number of unique problems regarding adequate fire prevention.

First of all, it goes without saying that projection rooms should be fireproofed according to regulations and proper care exercised in the handling, storing, and running of the film. Perhaps more important is the safe maintenance and sensible use of all electrical wiring and power supplies. These should be checked periodically. Overloading and overfusing should never be permitted. Also, entrance to the projection room is best arranged via a vestibule from the outside with the public strictly barred. For a more thorough discussion of fire prevention in projection rooms, refer to the article, "Eliminating Fire Hazards in the Motion Picture Theatre," in the February issue of IP.

Drive-in theatres generally are not located in cities. Therefore, they do not very often have the benefit of a speedy alarm-answering service in case of fire, or an up-to-date fire-fighting agency, or even an adequate water supply in some areas. To compensate for these possible shortcomings, the drive-in theatre must be sure to adhere to all the precautions. A good supply of the proper fire extinguishing equipment should always be on hand for an emergency. The staff should be trained to perfection regarding fire prevention, fire fighting as well as spreading the alarm. Provision should also be made for a readily available water supply. Also, first-aid kits should be liberally and conveniently distributed.

According to a study by the National Fire Protection Association, screen towers represent a likely place for fire to strike and should be constructed of noncombustible material. In addition, the NFPA recommends that all storage space related to the tower also be of fire-resisant material. Less than two years ago, a 74-ft. high screen at a drive-in theatre near Tucson, Arizona, was completely destroyed by fire at a loss of $38,000. Faulty wiring in a storeroom at the base of the screen was believed to be the cause.

Concession stands and buildings can also be trouble spots. Cooking and heating equipment should especially be watched. A careful check should be made of all appliances before closing to determine that they are all OFF. Municipal authorities have rigid regulations governing establishments where food is prepared with gas and electrical apparatus.

A final point on automobile fires. The danger of such fires is not nearly as great as that in an ordinary congested parking lot. When fires of this kind occur in a drive-in, drivers in surrounding vehicles can easily drive off to a safe distance. However, traffic must be made to move freely and employees should follow a set routine in regard to extinguishing the fire and calling in the alarm.

Your concessions may delight gourmets...



Your lounge may be the smartest...



BUT EVERY PERFORMANCE STILL MUST BE PERFECT!

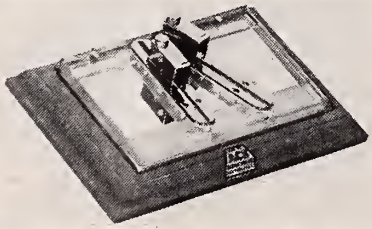
First matinee or midnight show, perfect performances demand equipment that runs like a top. There's no expert like an expert RCA Theatre Service Engineer to keep everything humming. He's the *only* man with full backing of RCA's long-famed technical resources.

RCA SERVICE COMPANY, INC.
A Radio Corporation of America Subsidiary — Camden, N.J.

Splicing Problems Are Coming!

If you're thinking of ordering a new splicer, be smart and investigate the Ace Clear Vision Film Splicer, a completely new method. From 8-mm to 70-mm.

- It makes a strong splice on acetate.
- Will splice the new DuPont Cronar base and join Cronar to acetate.
- It is non-magnetic — Will not injure CinemaScope soundtracks.



See your motion picture supply dealer or write direct to

ACE ELECTRIC MFG. CO., 1458 Shakespeare Ave., New York 52, N. Y.

New Drive-In Screen Paint

Radiant Manufacturing Corp. of Chicago has announced a new outdoor screen paint, called "Vynaplastic," designed for durability under rough weather conditions as well as good light return. Radiant reports that the new surfacing will not discolor, blister, or peel, and is self cleaning since it chalks gradually while maintaining the integrity of the surface.

Also mildew-proof, Vynaplastic requires no primers or sealers, and once properly applied can be repainted easily with brush, roller, or ordinary spray equipment.

MORE FROM ARCLAMPS

(*Continued from page* 15)

ventilation of the lamphouse at these high currents.

For currents of 110-135 amperes it is absolutely essential to have a minimum air velocity through the eight-inch chimney opening of the lamphouse of at least 700 lineal feet per minute. This velocity can generally be assured by constructing the exhaust ventilation system according to Fig. 3, using 8-inch diameter pipe or an equivalent

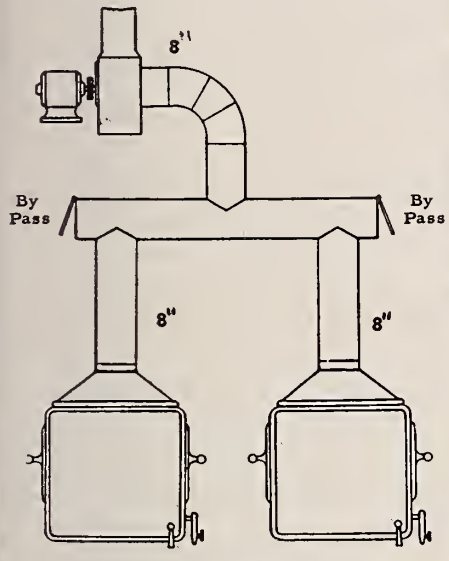


FIGURE 3

duct size all the way from lamphouse to fan to outside atmosphere.

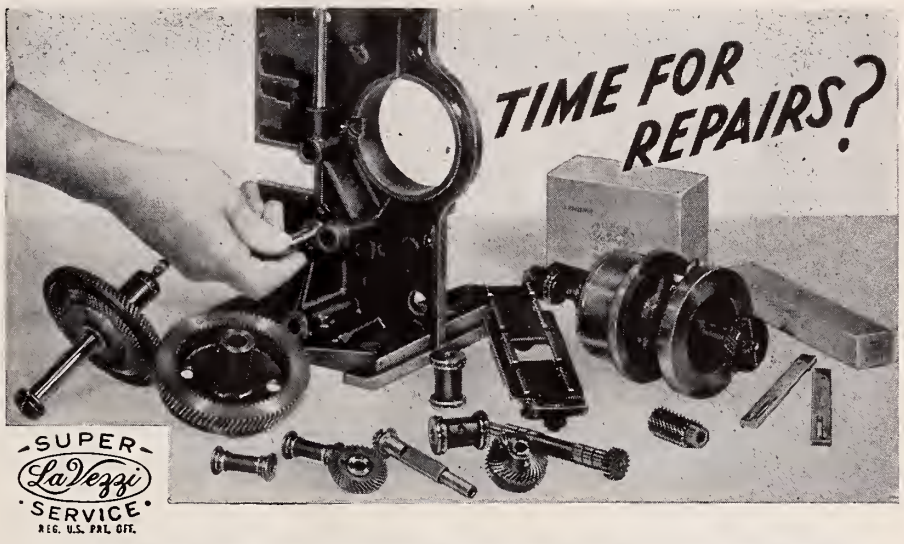
Type of Fan Needed

Fans should be of the centrifugal type with an 8-inch diameter intake opening. There are several good fans of this type available such as American Blower Model 80-H or Dayton Blower Model 7-C-038. Flow of air and balance between lamps should be regulated by installing a suitable by-pass in each line as shown in Fig. 3. For the Strong Mighty 90 and Super 135, the factory has designed a set of simple gauges to use as a guide to determine if a theatre's present air system is capable of meeting the minimum requirement for the ranges of 75-105 or 110-135 amperes. These gauges are available from the factory together with instructions for their use. The gauge indicates only that the draft is meeting the minimum standard required. The maximum draft can be used for any particular amperage is determined by the stability of the arc flame.

The by-pass opening in each lamp chimney duct should be opened a little at a time if necessary with the arc burning until any unsteadiness of the flame at the crater is eliminated. Do not however open the by-pass to such an extent that the draft gauge for the current you are using will not remain held up into the chimney. Do not attempt to reduce the air flow by restricting the full 8-inch pipe opening, either by the use of a damper or by the use of smaller pipe. Remove lamphouse damper entirely and reduce air flow by the use of the by-pass only.

Germany Outlaws Nitrate

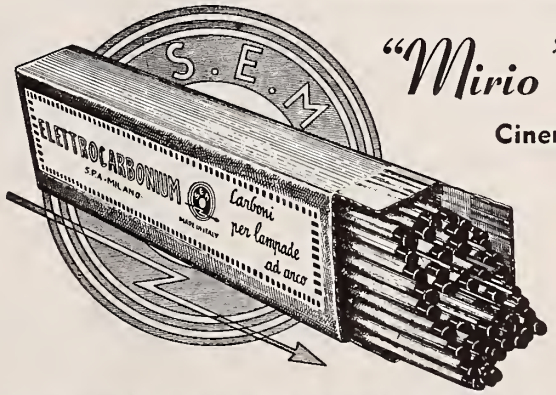
Beginning June, 1956, safety film will be the required standard in all movie houses in West Germany. It is expected that Austria will take similar action shortly.



Any wide screen system puts projection equipment to its severest test. Slight picture jump which may pass on a small screen cannot be tolerated on large screens. Your dealer is prepared to show you how your present equipment can be rebuilt to give unexcelled performance and long trouble-free service with genuine *LaVezzi* Projector Parts.

LAVEZZI MACHINE WORKS
4635 WEST LAKE ST. CHICAGO 44, ILL.





"Mirio"
Cinema Carbons

ELETTROCARBONIUM
VIA BORGHETTO. 5 — MILANO (Italy)

DRIVE-IN HERE TO STAY?

(*Continued from page* 19)

of electric in-car heaters that can greatly extend a season or make the business into a year-round operation. Extra wiring and heaters are typical of the new equipment that add to the initial cost of a drive-in, but also increase its profit potential.

Are there any serious threats to the future of the drive-in theatre business? There is perhaps one, but this is a cloud that hangs over the entire motion picture exhibition industry, not drive-ins alone. Drive-in owners don't worry much about Tv competition. So long as they have pictures to show, there will be cars full of customers looking for an evening of relaxed entertainment in the open air. But what if there aren't any pictures, or at least not enough of them? This is a question that all exhibitors have been screaming about since the new processes came in and Hollywood curtailed its assembly-line production methods.

There isn't any absolute answer to this question, but for the foreseeable future it seems likely that the *combined* resources of both indoor and outdoor theatres will provide a profitable distribution system for Hollywood motion pictures. Furthermore, since most drive-ins do not operate in winter, they are in the favorable position of having a backlog of releases to fall back on when they open in the Spring. They can, therefore, exist on a more sparse diet of film than the indoor theatre.

Although they often compete with each other for the customer's dollar, neither the drive-in nor the indoor theatre would be likely to survive permanently without the other. Probably both types of theatre are necessary if the present system of production of motion pictures for theatres is to remain profitable.



I'M ON MY WAY...

...to one of the 6,000 theatres ALTEC is proud to number among its satisfied customers.

"In that bag I carry are numerous special instruments expressly designed by ALTEC to assure the best possible sound service procedures.

"In the trunk of my car are ALTEC instruments, tools, and test films to achieve maximum quality performance of all types of sound systems.

"200 other ALTEC field engineers are similarly equipped.

"Accompanying us every step of the way are the resources, technical-know-how and reputation of ALTEC SERVICE CORPORATION, the finest sound service organization in the motion picture industry.

"Are YOU on my call list?"

ALTEC® SERVICE CORPORATION

161 Sixth Avenue
New York 13, New York

SPECIALISTS IN MOTION PICTURE SOUND

Clayton Ball-Bearing Even Tension Take-Ups

For all Projectors and Sound Equipments

ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS.
SILENT CHAIN DRIVE

THE CLAYTON REWINDER

FOR PERFECT REWINDING ON 2000-FOOT REELS.

CLAYTON PRODUCTS CO.

31-45 Tibbett Avenue New York 63, N. Y.

DRIVE-IN SCREEN LIGHT

(*Continued from page* 12)

image (black-and-white) prints. Color prints, on the other hand, can withstand up to about 200 amps. in mirror lamps and 275 amps. in condenser lamps when heat filters are used.

Water-cooled projector film gates, while contributing nothing to screen brightness, are very desirable to minimize heating of the edge-margins and celluloid base of the film by the conduction of thermal energy from the gate runners and tension pads. They also protect the mechanism from the deleterious effects of excessive heat and make the projectionist's work less painful when threading film.

Devices that blow cool air upon the film (especially the emulsion side) reduce the heat of the emulsion, but only very slightly. Air-cooling devices are much inferior to heat filters, and if improperly designed or installed, they may increase flutter and other focus-destroying movements of the film over the aperture. Air cooling of the film is admittedly of doubtful benefit in all but a few cases.

We are interested in supplying adequate levels of illumination for drive-in screens, but can we say how bright the screen is an outdoor theatre should be for acceptable projection results? A recent survey conducted by the SMPTE reveals that the great majority of drive-ins have screen brightnesses of only 2 to 4 footlamberts, comparing very unfavorably with the 10 to 20 footlamberts prevailing in most indoor theatres. A lesser number of drive-ins

have screen brightnesses in the 1-to-2 footlambert range, while only a small fraction of these popular operations (notably those having very small screens or specular screens) attain levels in excess of 4 footlamberts.

What Is a Footlambert?

Now, a *footlambert* is the unit measure of the apparent brightness of an extended surface, such as a motion-picture screen illuminated with "blank light" while the projector and shutter are running, but with no film in the machine. Since the average matte screen in good condition reflects from 70 to 80% of the light it receives from the projectors, the number of footlamberts of apparent brightness is somewhat less than the number of footcandles of illumination falling upon the surface of the screen. Light not reflected is absorbed and wasted.

$$\text{Footlamberts} = \text{Footcandles} \times \text{Reflectivity}.$$

A perforated matte screen reflecting 72% of the light and receiving 15 footcendles at its surface accordingly has a brightness of $15 \times 0.72 = 10.8$ footlamberts, which meets the *indoor-theatre* standards.

Measurements of illumination (footcandles) are usually made at the center of the screen, and measurements of the brightness (footlamberts) of the screen center are made from a point directly facing the screen. This is very important when measuring the brightness of metal- and beaded-surface screens, for these "specular" screens throw most of the light forward directionally, thus exhibiting apparent reflectivities in excess of 100% through narrow angles. Such screens merely "rob" the side areas of the theatre of light and concentrate it upon the central viewing area.

The illumination received by any screen from a projector depends upon the *area* of the screen (square feet) and upon the total *amount of radiant flux* projected by the lens (lumens).

$$\text{Footcandles} = \frac{\text{Lumens}}{\text{Screen area}}.$$

Projector or screen lumens (both are the same) may be calculated by either of the following formulas, depending on which particular factors were determined by direct measurement:

$$\text{Lumens} = \text{Footcandles} \times \text{Screen area}.$$

$$\text{Lumens} = \frac{\text{Footlamberts} \times \text{Screen area}}{\text{Reflectivity}}.$$

Conversely:

$$\text{Footcandles} = \frac{\text{Footlamberts}}{\text{Reflectivity}}.$$

$$\text{Footlamberts} = \frac{\text{Lumens} \times \text{Reflectivity}}{\text{Screen area}}.$$

Owners of drive-in theatres should make every possible effort to increase screen illumination, but the foregoing formulas, when applied to actual drive-in screen sizes and available projector lumen outputs, make it convincingly clear that the majority of drive-ins can never attain the high light levels found in the rank and file of conventional houses. The 3,500 to 5,500 lumens sufficient for most indoor theatres are not nearly enough for any but the very smallest drive-ins.

Lamp and carbon manufacturers usually measure the lumen output of projectors *without* the shutter running; and because the shutter in standard geneva-intermittent machines cuts off approximately half of the light, 3,500 to 5,500 lumens *with* the shutter running correspond to 7,000 to 11,000 lumens in the tables published by lamp and carbon companies. These values always assume the use of *f*/2 lamp optics, *f*/2 coated lenses, and either standard apertures of 1.375/1 aspect ratio (0.825" × 0.600") or CinemaScope

SPLICES NOT HOLDING ?

Film breaks are costly. Play safe by using

JEFRONA

All-purpose CEMENT

Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.

CAMERA EQUIPMENT CO.
DEPT. J-4-8
315 West 43rd Street New York 36, N. Y.

BREAKING MIRRORS?
you can solve your problem with
HEYER-SHULTZ UNBREAKABLE METAL REFLECTORS
5 YEAR GUARANTEE • *Maximum* SCREEN ILLUMINATION
SEE YOUR THEATRE SUPPLY DEALER • Manufactured by HEYER-SHULTZ, INC., Cedar Grove, N.J.

for VistaVision, CinemaScope, SuperScope

Lorraine ORLUX SUPER-CHARGED LARGE-CORED Carbons
For DRIVE-INS & THEATRES with HUGE, WIDE-AREA SCREENS • CARBONS, Inc. BOONTON, N.J.

and all other Wide-Screen Presentations

apertures of 2.35/1 aspect ratio (0.839″ × 0.715″) together with CinemaScope anamorphic lens-attachments.

It happens that 3,500 to 5,500 projector lumens (*with* the shutter running) are furnished by HI reflector lamps operated in the current range of 40 to 60 amperes. Drive-ins usually require greater arc currents for the simple reason that the screens in these theatres are so much larger than indoor screens. Projection throw—the distance from the projector aperature to the center of the screen—has nothing to do with picture brightness, and may be ignored in illumination calculations.

Considering the light-giving powers of commercial arclamps, the amount of heat that the film can stand, and the size of the screen in the average drive-in, we cannot see any possibility of going much higher than 4 footlamberts in most of these operations. This is only 1/3 the brightness of an adequately lighted indoor screen, and even well below the minimum 9-foot-lambert level recommended by the SMPTE for photographically satisfactory projection.

If *more* than 4 footlamberts can be obtained in a drive-in, well and good: the brighter the picture, the better the photographic reproduction. Very few drive-ins manage 9 footlamberts, and far too many struggle along with the abysmally dim level of only 1 footlambert.

The logic of our proposed 4-footlambert minimum standard for drive-in projection can be appreciated by examining the accompanying table showing the arc current needed to give 4 footlamberts of screen brightness (under the specified conditions) measured at the center of 60%- and 80%-reflecting matte screens, and 100%- and 120%-reflecting specular screens of various widths.

Required Amperage

The majority of drive-in screens range from 40 to 50 feet wide, even with CinemaScope. The table reveals that reflector-arc currents of from 65 to 95 amperes are required to produce the desired 4 footlamberts on 80%-reflecting matte (white) screens, all mirror, lens, and projector-shutter factors being favorable. A large number of drive-ins have screens from 50 to 70 feet wide, requiring HI reflector-lamp currents of 80—140 amps. when the screens are of the 100%-reflecting semi-specular variety. For a 60-foot, 80%-reflecting matte screen, minimum light requirements are met by a mirror arc burning 135 amps., or a condenser arc burning 200 amps.

Not an inconsiderable percentage of drive-ins have screen widths in the 90-to-100 foot range, an expression of the trend toward wider and wider screens. Frankly, these screens are *too wide* for good projection—at the present time, and cannot be adequately illuminated even when 120%-reflecting specular screens are used. More powerful arc lamps are not the answer, for 35-mm standard film cannot endure so much heat without undergoing irreparable emulsion damage. We suggest the most strongly directional screens for these gigantic theatres—screens having several hundred per cent of apparent reflectivity as viewed from the center—and discontinuance of several car positions at both ends of each ramp to eliminate the extreme side viewing-positions.

Drive-ins having screens wider than 100 feet (their number is increasing) are in a really bad position in regard to adequate screen brightness. Engineers who appreciate the light problem do not recommend the use of matte screens wider than 60 feet, or specular screens having satisfactory light-distributing properties wider than 70 or 75 feet. Persons accustomed to television viewing (picture-tube brightnesses corresponding to movie-screen brightnesses of from 30 to 300 (footlamberts) are inclined to be very dissatisfied with low drive-in light levels.

It should be kept in mind that the specified screen, or picture, width applies to both standard and widescreen aspect ratios. Projector lumens, we repeat, should be measured with the projector shutter running, *and with either a standard aperture or a CinemaScope aperture plus the anamorphic-lens attachment.*



ETHYLOID IS THE ONLY QUALITY FILM CEMENT SOLD ON THE BASIS OF ITS PHYSICAL PROPERTIES AND ACTUAL FILM SPLICING PERFORMANCE.

AVAILABLE AT ALL THEATRE SUPPLY DEALERS

FISHER MANUFACTURING CO.
1185 Mt. Read Blvd.
Rochester 6, N. Y.

Q: When is a mistake a blunder?

A: When a projectionist is not a regular subscriber to IP—a MUST reading for the projectionist craft.

Use the handy order form below

INTERNATIONAL PROJECTIONIST
19 West 44 St., New York 36, N. Y.

Enter my subscription for ☐ 1 year (12) issues—$2.50
☐ 2 years (24) issues—$4.00

Foreign and Canada: Add 50c per year

Name .....

Address .....

City ..... *Zone* ..... *State* .....

Crescent Sam had the drop on him—briefly



"I'M a she-wolf from Bitter Creek and it's my night to howl!"

Crescent Sam stepped into the kerosene glow of the biggest saloon in Perry, Oklahoma, and fired a six-gun into the air.

Suddenly, he spotted the stern-faced peace officer you see here. He aimed and pulled.

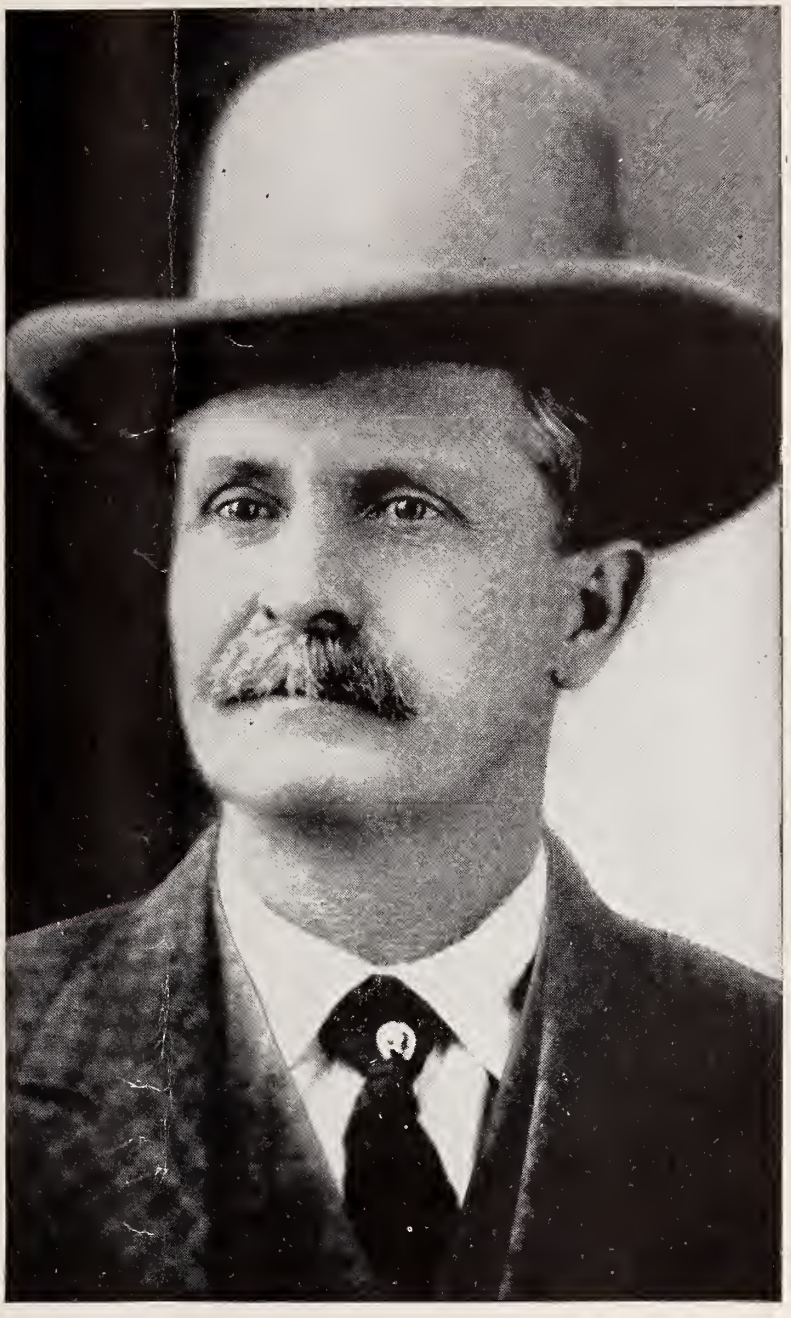
And in a gun flash, he lay dead.

Crescent Sam, thief and killer, had made the fatal mistake of trying to outshoot Bill Tilghman. Tilghman who could hole the ace of spades at 30 feet. Tilghman who in later years said, "I never shot at a man in my life and missed him."

Bill Tilghman was no legendary gun fighter. He was the genuine article, a fearless, honest frontier marshal described by the San Francisco Examiner as "the best peace officer the West ever knew."

His hardy pioneering spirit and resolute courage are a legacy today's 160 million Americans are very proud to share. And when you consider that those Americans are the people who stand solidly behind U.S. Savings Bonds, it's easy to see why these Bonds are regarded as one of the world's finest investments.

Why not guard *your* security the safe way that helps your country? Invest in—and hold—U.S. Series E Savings Bonds.



* * *

It's actually easy to save money—when you buy United States Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done *for* you. And the Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, for as long as 19 years and 8 months if you wish! Sign up today! Or, if you're self-employed, invest in Bonds regularly where you bank.

Safe as America—U.S. Savings Bonds

PUBLIC SERVICE ADVERTISING COUNCIL

The U. S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

"IT'S A WONDERFUL LIFE... since our new Simplex equipment was installed! Getting a sharp picture on the screen and keeping it there is as easy as eatin' pie! No more 'sweating out' every performance. No more breakdowns . . . film slippage . . . blackouts and tough changeovers. The steady, dependable hum of my Simplex projector is music to my ears. Life is rosy again . . . why, I've practically stopped arguin' with my wife! No wonder almost every great theatre I know of has this same equipment. If your equipment is getting weary... take my advice and tell your boss about . . .



Simplex
T.M. REG. U. S. PAT. OFF.
X·L

PROJECTION AND SOUND SYSTEMS

MANUFACTURED BY
INTERNATIONAL PROJECTOR CORPORATION

DISTRIBUTED BY
NATIONAL THEATRE SUPPLY

SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

PROJECTIONIST

INTERNATIONAL



MAY 23 1956

MAY 1956

VOLUME 31 • NUMBER 5

30c A COPY • $2.50 A YEAR

No lamp in the World!

CAN PRODUCE SO MUCH LIGHT.

Peerless Hy-Candescent TRADE MARK REG

CINEARC

NOT A REFLECTOR ARC!

WRITE FOR DATA

Peerless MAGNARC TRADE MARK REG

CINEARC

A 75-77 AMP. REFLECTOR ARC!

22,000 TOTAL LUMENS ON SCREEN

NO-HIGH-RATE *OF ($60.00) REFLECTOR BREAKAGE AND SILVERING DETERIORATION OR HEAT FILTER UPKEEP* !

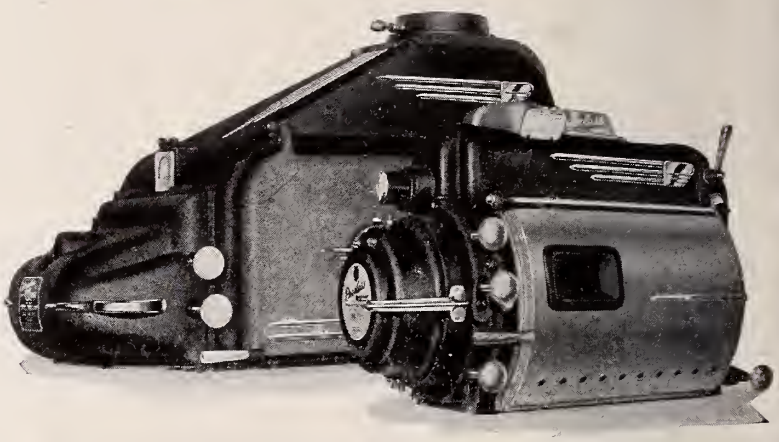
PROOF

Hy-Candescents were selected for all **important** "CINERAMA" installations. (Chicago, New York, Los Angeles, San Francisco, Philadelphia, and Washington, D. C.)

Hy-Candescents were chosen by Paramount for **all** installations of Horizontal "VISTA-VISION".

Hy-Candescents were again selected by TODD-AO for "OKLAHOMA".

You have to do the same if you want all the light there is for big pictures.



At 75-77 amperes . . . With presently available and standard 8 x 9 m/m copper coated carbons . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . With a 14" diameter No. 2012 PEERLESS "Hy-Lumen" glass reflector that retails at a list price of $22.00 F.O.B. Chicago . . . With a No. 2880 PEERLESS Tail Flame Flue . . . On any kind or any size screen . . . No Heat Filter required.

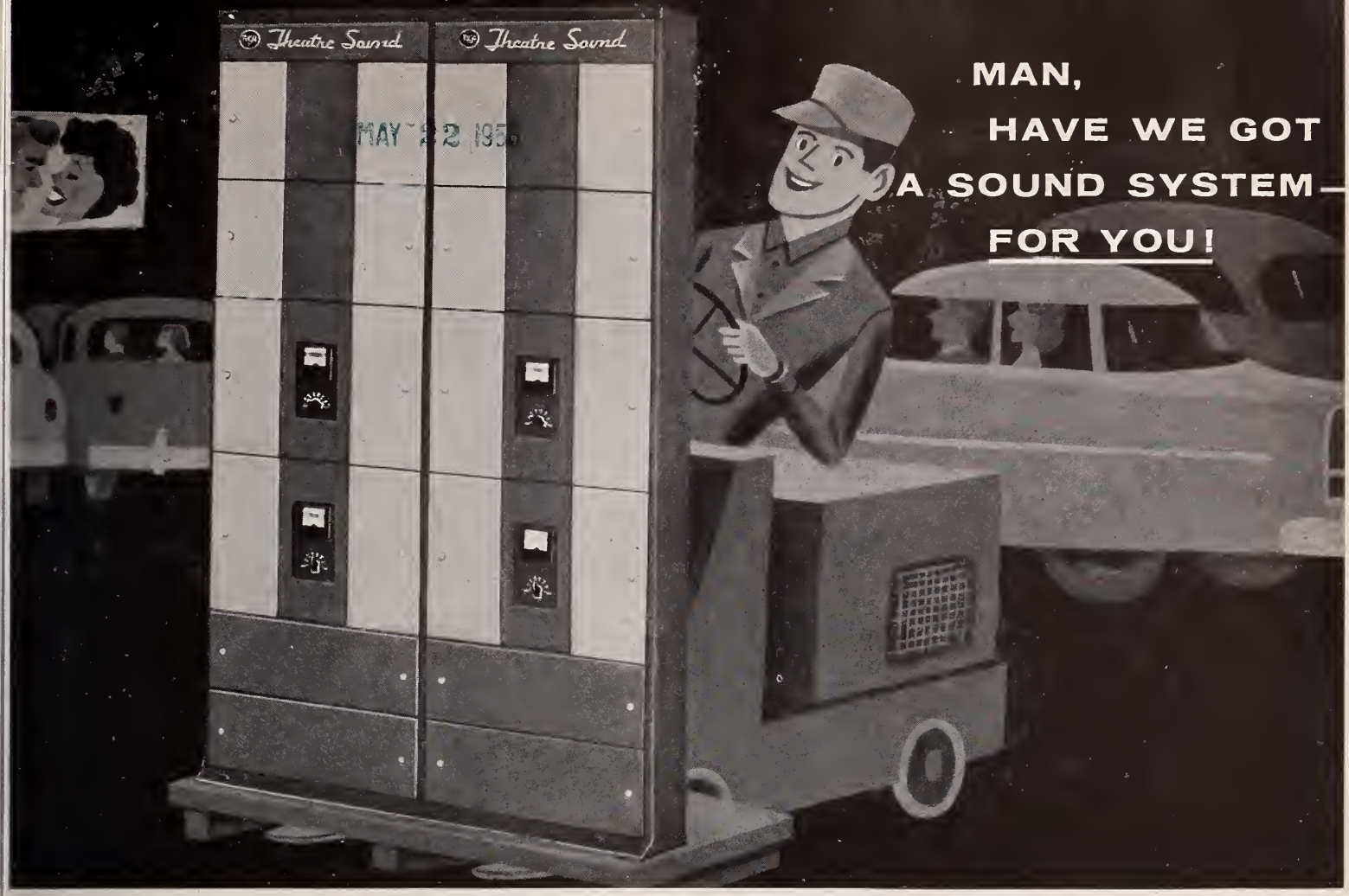
All of this, at the **lowest** possible first, and operational **cost**. And

J.E.McAULEY MFG.CO.

552-554 WEST ADAMS STREET

CHICAGO 6, ILLINOIS

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION



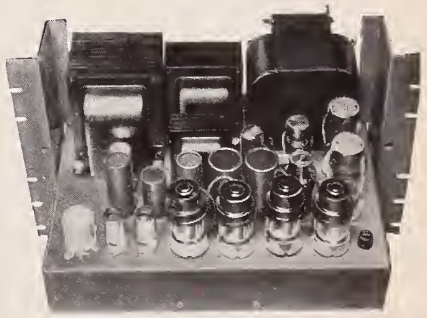
Two new RCA Amplifier Systems to draw patrons into Your Drive-in!

As patrons relax right in their own automobiles, the sound they hear is the finest quality attainable in Drive-ins. That's the kind of box-office-building reputation your drive-in wins when you install an RCA Amplifier System, featuring RCA's new 150-watt power amplifier.

Choose the 600-watt or the 300-watt RCA Amplifier System. Both reproduce optical or magnetic sound with *real* fidelity for as many as 2400 cars. In both, separate channels specially tied together make sure your show goes on despite emergencies. An automatic photo-cell polarizing network equalizes the two channels' voltage output, so that operating voltage for your whole RCA Amplifier System can be supplied by a single channel should conditions demand it.

Two-gang volume control continuously synchronizes volume in both channels. Thanks to advanced RCA rack construction, servicing is easy. Tip-out rotating chassis allow greatest accessibility.

Details on the new RCA Amplifier System for your drive-in come from your independent RCA Theatre Supply Dealer. And he's the man to see about an installation of top-quality RCA In-Car Speakers to deliver this high-fidelity sound faithfully to every patron's ear. Ask him, too, about RCA projection equipment, advanced-engineered by the leading name in sound *and* projection. Your RCA Theatre Supply Dealer . . . the man to see *today!*



POWER SUPPLY combines rugged construction with easy accessibility for rapid servicing.

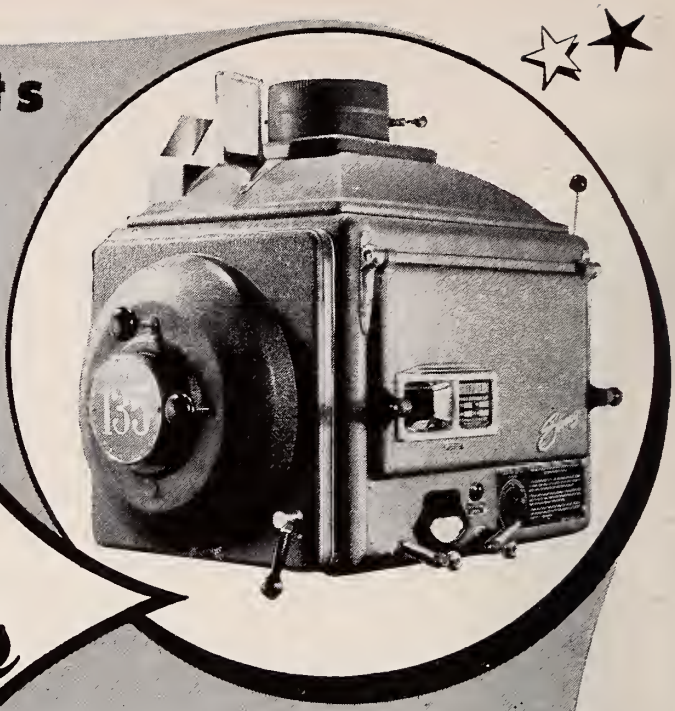


300-WATT RCA Amplifier System may be used singly, or combined as shown, to provide 600-watt system. Note advanced RCA rack construction.

RCA

THEATRE EQUIPMENT
RADIO CORPORATION of AMERICA
ENGINEERING PRODUCTS DIVISION CAMDEN, N. J.

Why Proponents of the New Projection Techniques Are *Switching to Strong Lamps*



Strong engineers, working with the developers of the various new projection processes, have been enabled to not only meet present screen lighting demands but to anticipate future requirements.

New conversion features engineered by Strong to fit into Super 135 projection arc lamps, to assure perfect screen lighting for the new 55, 65 and 70 mm wide film productions are now ready for your adoption. When you equip for any of these projection techniques, provision can be made for burning the 20-inch 13.6 mm carbons. A wider opening can be provided in the nose of the lamp, it can be fitted with a new dowser which fully covers the bigger opening, and a new high magnification mirror.

OUTSTANDING FEATURES OF THE STRONG SUPER 135 INCLUDE:

★ 18" f 1.7 ar 16-1/2" f 1.9 reflector.

★ Infra Ban Beam Caaler. Diverts heat rays fram aperture. Remavable halder. Easy cleaning. Blawer coaled.

★ Reflectar and frame coaling device.

★ Exclusive Lightranic system cantrals the burning of both carbans. Automatically maintains pasitive arc crater at the EXACT facal paint af the reflectar. A perfect light, evenly distributed, of constant intensity and unchanging color value, is maintained WITHOUT MANUAL ADJUSTMENTS—exactly the same far bath lamps. Changeovers cannat be naticed. Eliminating the need of hand feeding and carrectian of the carbon crater pasition, better enables the prajectianist ta render a good presentation of the more complicated techniques.

★ Lurn a chaice af faur carban trims, 9, 10, or 11 mm regular and 10 mm Hitex, ta attain any desired degree of cast of operatian, screen illuminatian, or burning time. Quick, simple changes attain the correct light requirements for VistaVision, CinemaScope, Cinerama, or any ather presentatian technique—even two or mare an the same pragram. A TRULY ALL-PURPOSE LAMP!

★ Single cantral amperage selection.

★ The arc is stabilized by its awn magnetic field (na magnets are required) and an air jet. Prevents deposit of soat on reflector.

★ Unitized campanent design.

★ Lang-life pasitive carbon cantact. Water-cooled carbon cantact assembly (aptianal).

Impartial Foot-Candle-Meter Tests Will Prove that the Strong Super 135 Projects the Brightest Pictures Today.

THE STRONG ELECTRIC CORPORATION

"The World's Largest Manufacturer of Projection Arc Lamps"

31 City Park Avenue • Toledo 2, Ohio

Please send free literature on Strong Projection Arc Lamps.

NAME_____

THEATRE_____

STREET_____

CITY & STATE_____

International PROJECTIONIST

R. A. ENTRACHT, *Publisher*
JAMES MORRIS, *Editor*
R. A. MITCHELL, *Contributing Editor*

Volume 31 MAY 1956 Number 5

Index and Monthly Chat 5
Evaluating Film Base Materials 7
ROBERT A. MITCHELL
Projection Advances on the Way 12
HERBERT BARNETT
SMPTE Convention Stresses Standards 13
JAMES MORRIS
Technicolor Improves Color Printing Process 14
Brushup on Fundamentals 15
Four Years of Cinerama 16
NORMAN WASSERMAN
Ray Brian—Philoprojectormaneologist 17
In the Spotlight 20
IA Election 21
Selection and Maintenance of Sound Equipment In Drive-in Theatres 22
A. J. PLATT
Projectionists Play Important Role in Altec Stereosound Promotion 23
"Thrillarama" Joins Lists of New Processes 23
Any Chance for a 3-D Resurrection? 24
Harry Strong and Karl Brenkert Die 24
Science Notes 25
More Efficient Drive-In Projection 26
F. W. KEILHACK
Letters to the Editor 26
Book Reviews 28
Ampex Records TV Picture on Magnetic Tape 29
Obituaries 31

INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co., Inc., 19 West 44 Street, New York 36, R. A. Entracht, President. Telephone: MUrray Hill 2-2948. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States and U. S. Possessions, $2.50 per year (12 issues) and $4.00 for two years (24 issues). Canada and Foreign countries: $3.00 per year and $5.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Entered as second-class matter February 8, 1932, at the Post Office at New York, N. Y., under the act of March 3, 1879. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles.

Entire contents copyrighted 1956 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

420

Monthly Chat

SMPTE Concentrates on TV

THE DYNAMIC quality of the TV industry is well illustrated by activities at the convention of the Society of Motion Picture and Television Engineers held early this month in New York City. Interest of participants was generally focused on new products or engineering improvements for TV broadcasting or the mushrooming business of producing films for use over TV. A distinct change could be noted from other recent SMPTE conventions when the hurried introduction of the "new projection techniques" resulted in a heavy proportion of papers on theatrical equipment being read.

In the past IP has frequently commented on the tendency of the motion picture industry to ignore the opportunity for technical progress that lies in a *consistent* industry-wide program of experiment and technical development. It is well known that most of the new processes were available for years before the industry was willing to try them. A well-planned program of research and development might have done much to prevent the post-war drop in attendance and also prevented much of the confusion and extra expense involved in hurried conversion.

It surely would be worth while if the motion picture industry were to take a leaf from the TV industry's book and invest in a large-scale, consistent research program. This should be a far-sighted program of the calibre that is enabling the TV industry to make the tremendous jump from black-and-white to color, a feat that is not being accomplished as a result of an overnight discovery but only after years of joint effort and planning on the part of many different segments of the TV industry.

2,300 Theatres Need Equipment

WE HEARD a few weeks ago that there are still about 2,300 theatres in the United States which suffer from a severe shortage of product for technical reasons. The shortage results not so much because fewer pictures are being produced these days, but because these theatres still have not converted their projection equipment for CinemaScope. It is estimated that the theatres concerned miss about 30 pictures a year in this manner, and that many of these pictures are heavily-promoted features which would attract extra patrons. For what producers and distributors consider valid economic reasons, many who use the CinemaScope process do not go to the expense of making available a supply of "unsqueezed" standard prints for every 'Scope feature.

It is probably true that many of the theatres concerned are small marginal houses whose owners are caught in a painful financial squeeze in the struggle between theatrical exhibition and home TV. Also some may feel that they have been made the "goat" in the past for expensive Hollywood confusion on the subject of projection equipment. However, if these exhibitors have faith in their ability to continue the struggle, they must also realize that they have much less chance of winning when they fight with one hand tied behind their backs. The minimum cost for conversion is relatively low, and the present-day film audience is nothing if not discriminating.

Another bonus in screen brightness!

11% more light...

20% slower burning...



Greatly improved NATIONAL TRADE-MARK 10mm x 20"
High Intensity Projector Carbons

THE PAST TWO YEARS have seen constant improvement in "National" Projector Carbons. A new "Suprex" 7mm Carbon, "Suprex" 8mm Carbon, and now, a greatly improved 10mm High Intensity Carbon — all designed to give you more light and longer burning.

The objective of all these improvements is to provide for exhibitors the finest picture quality at lowest cost. The same leadership that has made "National" Projector Carbons outstanding over the years is still at work for you — with more new improvements to come.

Carbons are such a small part of overall cost, yet such an important element of superior projection. Be *sure* you have the best — always buy "National" Carbons.



THE PICTURE IS LIGHT...
GIVE IT ALL YOU CAN WITH
"NATIONAL" CARBONS

The terms "National" and "Suprex" are trade-marks of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY • **A Division of Union Carbide and Carbon Corporation** • ***30 East 42nd Street, New York 17, N.Y.***

SALES OFFICES: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco • **IN CANADA:** Union Carbide Canada Limited, Toronto

INTERNATIONAL PROJECTIONIST

VOLUME 31 MAY 1956 NUMBER 5

Evaluating Film Base Materials

By ROBERT A. MITCHELL

The ability of film base materials to withstand the many stresses of repeated projection is discussed in this article. Nitrate and triacetate bases are considered, and an estimate is made of the new polyester base which is expected to be in use before long.

THE PROJECTION process imposes severe conditions upon any plastic used as the base, or emulsion support, of theatre-release positive film. If the film fails to meet the requirements of the projection process, if it fails to hold up under conditions of intense heat and mechanical stress, the pictures on the screen will be very poor.

Moderately nitrated cellulose combined with suitable plasticizing agents (camphor, castor oil, tricresyl phosphate, etc.) was universally used for the base of professional 35-mm motion-picture film during the fifty years between the late 1890's and the late 1940's. Nitrate film was a remarkably satisfactory material for projection prints despite its dangerous inflammability and marked tendency to deteriorate even in storage. In fact, certain of the excellent operating characteristics of nitrate film have never been equalled by film of any other type.

Nitrate Was Standard

So good is fresh nitrate film of the best quality that many of its physical characteristics are accepted, even today, as standards which must be met by new and experimental materials intended for use as theatre-release positive base.

The earlier diacetate and acetopropionate *safety* film-base materials failed to come up to the high performance standards of nitrate base, and were accordingly rejected by theatre projectionists even though such films eliminated the fire hazard. Only in comparatively recent times has an acetate of cellulose been produced having physical properties similar to those of fresh nitrate stock. The cellulose triacetate safety film in use at the present time is almost as good as fresh nitrate film and very much better than worn and shrunken nitrate film.

As all but the youngest members of our craft will recall, nitrate prints gave us beautifully steady and sharply focused pictures on our screens. Nitrate film was tough, flexible, and rigid in the projector gate. It was resistant to tearing and could stand a great deal of abuse with no significant deterioration of picture quality. The explosive inflammability of nitrate base was a constant worry, and occasionally the cause of disaster. Many of us projectionists, in fact, viewed the passing of nitrate film in 1947 with a certain amount of regret because of understandable prejudice against the unsatisfactory safety films we had occasionally encountered previous to that year.

Anyone who has ever projected diacetate safety film in a theatre cannot easily forget how film of that type (no longer manufactured) buckled, shrank, and became brittle. Diacetate film gave pictures that jumped and fluttered in and out of focus. And when triacetate safety film entered the field, projectionists were justifiably irked by splicing difficulties. The film exchanges had failed to notify the craft that regular nitrate cement would not produce solid joins in the new safety film! And that was not all.

Perfection of Acetate

Being accustomed to the characteristics of nitrate film, projectionists were quick to notice such deficiencies of triacetate film as slightly lower resistance to the tearing action of sprocket teeth on the perforations, and a tendency of the perforation margins to warp under the influence of heat and buckle the film. Also, triacetate film was more sensitive than nitrate to slight irregularities in the surfaces of

the gate runners (film-trap rails) and tension pads (pressure shoes). Focusing became more difficult.

It was not until the furor of the innovation died down that we truly appreciated the safety factor and realized that triacetate film, while inferior to *fresh* nitrate film in a few respects, was vastly superior in others and retained its original good qualities long after the best nitrate prints subjected to the same amount of usage had literally rotted away.

We learned by experience to replace sprockets the moment the teeth showed signs of wear and to check the condition of the film gate more frequently. And as the years passed we knew that triacetate film, whatever its drawbacks when first introduced (in the form of double-coated Trucolor prints), was being steadily improved, thanks to the untiring efforts of Eastman Kodak research and film-manufacture engineers.

Now ambitious plans are afoot to supplant all esterified cellulose film bases with non-cellulose plastics among which certain polymerized esters chemically related to well-known artificial fibers have gained a pre-eminent position. Introduction of these polyester film bases may well result in widespread changes in projection practice. Unfortunately, it is still too early to completely evaluate the new polyester film base because it is still undergoing tests. Some general information is available on polyester film, however, and this article will attempt to compare experimental samples with nitrate and presently-standard triacetate film.

Suppose we begin our survey with the well-known characteristic called *toughness* and divide it into *tensile strength* (resistance to breaking) and *tear strength* (resistance to tearing with particular reference to the cracks that first appear at the corners of the sprocket holes).

TOUGHNESS

(1) Regardless of its explosive inflammability, nitrate film is tough. Unless twisted to start a tear at its edge, a piece of fresh nitrate film can withstand a tremendous pulling force before it breaks. Triacetate safety film has very nearly the strength of nitrate film. We may therefore regard the tensile strength of either nitrate or triacetate film as the standard that any new type of film must meet to be acceptable to the craft. Polyester film has fully two times the tensile strength of nitrate or triacetate.

(2) Tear strength is as important as tensile strength when considering the toughness of motion-picture films. Fresh nitrate film is usually very resistant to tearing. Even when small tears have started at the corners of the perforations (due to many showings or to excessive gate tension), the cracks increase in length so slowly that the film may be used for a long time before the perforations fail entirely.

Triacetate safety film has a tear strength of only 70% that of *fresh* nitrate film of good quality. The rather low tear strength of triacetate is admittedly one of the more serious deficiencies of this type of film; but it should be remembered that nitrate film varies widely in quality and that old and heat-deteriorated nitrate film may be appreciably weaker than old, much-used triacetate film. On the whole, however, the projection life of these two types of film ranges from 1,000 to 10,000 showings, depending upon the condition and adjustment of the projectors.

Polyester film is said to have from 1½ to 2 times the tear strength of nitrate film. Such material may last for as many as 20,000 showings before the perforations wear out. Theatre-release prints, however, are generally run no more than 300 to 600 times before they are retired from circulation.

PLIANCY

(1) The term "pliancy" is associated with both "flexibility" and "softness," and is hence a term we must use cautiously. We don't want stretchable or rubbery films. We need flexibility *plus* rigidity, properties more closely associated with thin steel tape than with stretchy or rubberlike substances. Now, both *fresh* nitrate film and triacetate film are flexible (easily wrapped around sprockets and rollers) and at the same time sufficiently rigid to hold nearly flat in the film gate.

(2) The "elasticity" of a flexible film denotes the quality of rigidity we mentioned above. As scientists use the word, elasticity means the ability to spring back into shape after the removal of deforming forces, not a spongy, rubbery quality. Tempered steel, or example, is much more elastic than rubber. A steel ball bearing dropped upon a block of quenched uranium steel bounces better than a rubber ball.

Nitrate motion-picture film is more elastic than either triacetate or any sample of polyester film we have examined so far. The ability of nitrate film to lie flatter over the aperture of a projector than any other type of film is due to its high degree of elasticity.

RESISTANCE TO HEAT AND STABILITY IN STORAGE

The heat generated in the photographic emulsion of film by the intense beam from the arc lamp normally produces transient distortions of the exposed frames. Instead of lying perfectly flat, the film bulges toward the lamp, the emulsion expanding more than the base. The degree of "pincushioning" of the frame over the aperture is somewhat greater for safety film than for the more rigid nitrate film.

(1) A perfectly elastic film would spring back to its original flat shape after passing by the hot blaze of light at the aperture, of course. Such a return to normal shape actually occurs with both nitrate and triacetate film; but after a large number of projections a slight permanent elevation of the individual frames indicates that the restoration to the original flatness of the film is never quite complete. The effect of raised frames is known as "frame embossing."

Now even though triacetate base is appreciably less elastic than nitrate base *at ordinary room temperatures*, safety prints exhibit less frame embossing than nitrate prints which have been

	B & W emulsion	"Duplitized" color	B & W	Multilayer color	B & W	Multilayer color
	Nitrate base	Nitrate	Triacetate	Triacetate	Polyester	Polyester
Base:	0.0050"	0.0050"	0.0055"	0.0055"	0.0040"	0.0040"
Total:	0.0055"	0.0060"	0.0060"	0.0065"	0.0045"	0.0050"

Direct visual comparison of the thicknesses of different types of processed theatre-release film. Note the relative thicknesses of the base and emulsion layers.



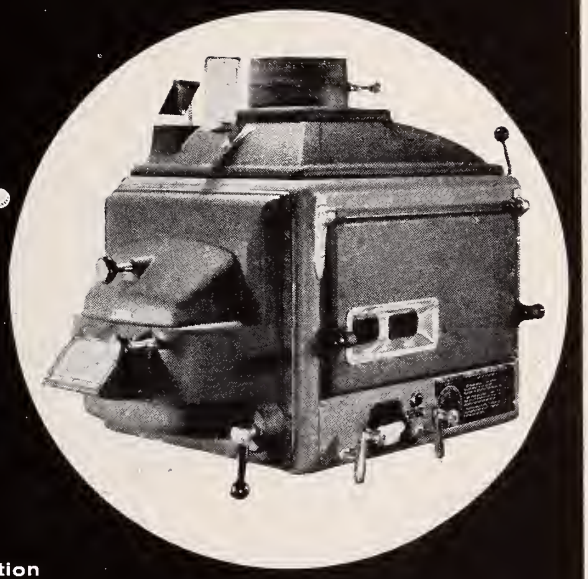
"Want a light, mister?"

Want a really good light on your screen—

regardless of how big—

regardless of the projection process—

regardless of the film width?



EXCELITE "135"

PROJECTION ARC LAMPS

New conversion features ready for your adoption when you equip for wide film presentation include provision for burning 20-inch 13.6 mm carbons, a wider opening in the nose, a dowser which covers the bigger opening, and a new high magnification mirror. The Excellte "135" comes equipped with an 18" f 1.7 or 16-1/2" f 1.9 reflector and burns a choice of 9, 10, or 11 mm regular or 10 mm Hitex carbons, with single control amperage selection. Long-life positive carbon contacts. (Water-cooled carbon contacts optional.) Automatic Crater Positioning System prevents color change in screen light. Air jet arc stabilization keeps tall flame from reflector. Prevents deposit of soot and formation of heat absorbing scum which causes mirror breakage. Blower cooled removable Reflect-O-Heat unit for reducing aperture heat. Unit construction.

IT'S FROM NTS

NATIONAL THEATRE SUPPLY

Division of National • Simplex • Bladewith Inc

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

NOW BEING DISTRIBUTED TO ALL PAID SUBSCRIBERS TO THE FILM DAILY

★ ★ ★ ★

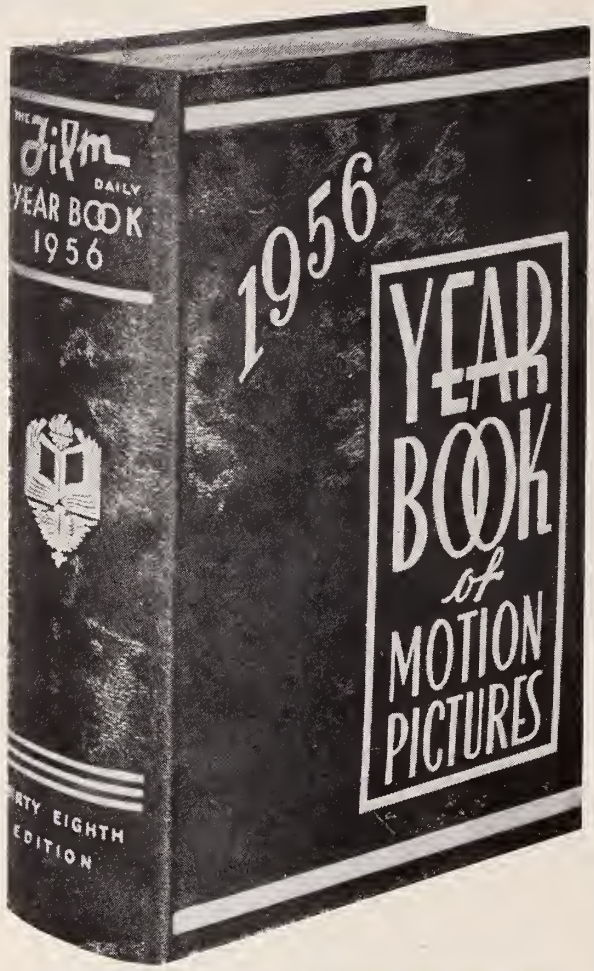
1956

YEAR BOOK
of
MOTION PICTURES

NOW

being
distributed
to all subscribers

★ ★ ★ ★



Over 1200 Pages—Covers Everything—Beautifully Bound

★ ★ ★ ★

Film Daily Year Books

Are given without extra charge to all paid subscribers to THE FILM DAILY, the Industry's Oldest and Most Widely Read Daily Trade Paper.

For 38 Years
THE FILM DAILY
and YEAR BOOK
of
MOTION PICTURES

Have been the most comprehensive source of information in the Motion Picture Industry.

Complete news coverage daily . . .

THE FILM DAILY

The Industry's oldest daily trade paper, published five days each week. Vital news of the industry that is essential to everyone in this industry today. Production, Distribution, Exhibition, 3-D, CinemaScope, Cinerama, Todd-AO, Vista-Vision, Wide-Screen, Stereophonic Sound Systems, Lenses, Equipment Packages and Television. Constructive editorials. Analytical, showmanship feature reviews that will help any exhibitor in the selection of his programs. Hearings and decisions of exceptional spot value to exhibitors and distributors. News presented in the same brief readable, interpretive, interesting style which THE FILM DAILY has maintained during these past thirty-eight years of serving the industry.

THE YEAR BOOK CONTAINS:

Revised list of all U. S. theatres, arranged by states and cities and towns . . . Roster of theatre circuits, with home office addresses and executive personnel . . . Up-to-date separate lists of drive-in theatres, art theatres . . . Personnel of companies, studios, associations, guilds and unions in the motion picture field . . . Complete credits on all 1955 releases . . . Financial statements of principal industry companies . . . Complete television section, including stations, personnel, telepix producing and distributing companies, advertising agencies . . . Equipment companies with addresses, executive personnel and product manufactured . . . Theatre supply dealers arranged alphabetically by cities, with addresses, telephone numbers and executive personnel . . . List of all film exchanges, arranged by cities, with addresses and names of managers . . . Full rosters of film companies, laboratories, projection rooms, trailer companies, insurance brokers . . . Books on the motion picture and television . . . Publications in the motion picture field . . . Television-radio publications . . . Motion picture editors and radio-TV commentators on films . . . Alphabetical title list of more than 25,000 feature pictures distributed in the U. S. since 1915, with The FILM DAILY Review and release dates . . . Serials released since 1920 . . . Expanded Foreign Film Section . . . Legislation restrictions in foreign film markets . . . Revised film industry statistics covering production, distribution and exhibition . . . Credits of players, producers, directors, cinematographers, film editors, writers, art directors . . . New York and Hollywood industry telephone directories . . . Agents and managers in Los Angeles and New York . . . Play and story brokers . . . Business Administrators . . . Leading Los Angeles publicists and public relations counselors . . . an authoritative history of the industry year.

AND 1,001 OTHER IMPORTANT FEATURES

★ ★ ★ ★ ★

A WEALTH OF INFORMATION
IS yours when you become a subscriber to
THE FILM DAILY

Get Your Copy NOW – Mail This Coupon Today

★ ★ ★ ★ ★

The Film Daily Year Book covers—in One Volume—all statistical and informative data on the motion picture industry along with a complete Section on Television and places at the fingertips of executives, producers, distributors, exhibitors and all those in any way interested in the film industry—a wealth of valuable information.

★

A subscription to THE FILM DAILY will keep you informed on industry spot news, equipment and reviews and will answer your every question on motion pictures and television throughout the year.

THE FILM DAILY
1501 Broadway
New York 36, N.Y.

THE NEWSPAPER OF FILMDOM — The Film Daily — ALL THE NEWS ALL THE TIME

Hollywood Office
6425 Hollywood Blvd.
Hollywood 28, Calif.

Gentlemen:

Please enter my subscription to THE FILM DAILY, and send me my copy of THE 1956 FILM DAILY Year Book. I enclose $15.00 (Foreign $20.00).

Name: .....

Street: .....

City: .....

projected an equal number of times under identical conditions. At higher temperatures safety base is actually *more elastic*, more stable, than nitrate! Triacetate base begins to soften at 100° C.; nitrate base at a temperature somewhat below 90° C., depending upon the age and condition of the nitrate film.

(2) The superiority of triacetate safety film over nitrate in regard to permanence toward heat is also seen when the two types of base are exposed to heat of moderate intensity and tested for brittleness. When hot, nitrate film loses its rigidity and becomes so soft that it can be molded. Triacetate film retains its rigidity and becomes brittle. But when the films are cooled, nitrate becomes even more brittle than triacetate.

Exposure to heat nevertheless buckles and warps triacetate film more readily than nitrate film. This effect of heat manifests itself principally in the perforation margins of film. The margins contact the hot metal of the gate runners and pressure pads and absorb a great deal of heat from them. Nitrate film softens and then hardens again, the flatness of the metal serving to remold the margins to their original flatness. Not so with triacetate, which doesn't soften. The margins warp and stay warped. Safety film then becomes edge-curled and buckled, making the picture difficult to focus. But nitrate film also buckles under such treatment because the margins are shrunk by the heat! The picture area of the film, having a greater longitudinal dimension than the margins, is forced into a wavy shape.

Behavior Under Heat

Polyester film, when properly formulated, is more heat-resistant than either nitrate or triacetate film. Samples tested by the writer undergo no measurable warping or shrinkage when subjected to heat sufficiently strong to produce these effects in both nitrate and triacetate stock.

(3) Both nitrate and triacetate film become brittle when exposed to high temperatures and then cooled. But only nitrate gets brittle with the passage of time. Triacetate and polyester films are alike in that they can be stored for many years without acquiring any brittleness. Nitrate films also shrink, while triacetate and polyester films do not.

(4) The shrinkage of motion-picture film has an important bearing upon the design of projector mechanisms. An irregular degree of shrinkage in the film causes a vertical weaving of the picture which can be minimized only by positioning the intermittent sprocket and the aperture as close together as possible.

Moreover, the diameter chosen for the 16-tooth intermittent sprocket must be such that the sprocket will accommodate film having an average amount of shrinkage. Too large a sprocket results in tearing, crackling, and sizzling noises due to the disengagement of the sprocket teeth from the film perforations, while too small a sprocket, even though quiet in operation, increases the rate of perforation wear.

The shrinkage of nitrate film by heat and time has always been a troublesome factor in the projection of this type of material. Older samples of nitrate film shrink up to 1.6%, but the average amount of shrinkage noted in theatre-release nitrate prints during their active life is only about 0.4%. The intermittent sprocket, therefore, must accommodate shrinkages near the maximum, or at least a little above the average, hence the diameter of 0.935 inch chosen for intermittent sprockets made prior to the introduction of non-shrink triacetate film.

The exclusive use of triacetate film has eliminated the shrinkage problem. But because old nitrate prints are still used from time to time, the new larger sprockets are made with a diameter of 0.943 inch to permit the running of nitrate prints as well as to give good results with triacetate prints. With the complete discontinuance of nitrate film, the diameter of the intermittent sprocket will be increased to 0.945 inch.

(5) We have pointed out that nitrate film becomes brittle and shrinks with the passage of time. It also decomposes chemically, becoming discolored, very weak, sticky, bad-smelling, and spontaneously explosive. Even unused nitrate film stored under ideal conditions of temperature and humidity deteriorates to such an extent that it is practically worthless after about 50 years.

Triacetate film is as permanent as any other known type of film, its life in storage being estimated at 1,000 years. And triacetate film does not require so moist an atmosphere for satisfactory storage that nitrate film does. The gelatine emulsion is thus better protected against molds and fungi that destroy it. Polyester film is also permanent and equally immune to shrinkage.

Shrinkage Characteristics

The processing of motion-picture films involves their immersion in various aqueous solutions, a long period of washing after development and fixing, and subsequent drying. Nitrate film slowly expands when immersed in water, and then shrinks to its original length when dried. Earlier types of safety film, notably those made of cellulose diacetate, expanded and shrank too rapidly, causing slack loops in the processing machines and film breaks in the drying cabinets.

Modern triacetate safety film expands and contracts to a lesser degree, and quite as slowly, as nitrate film. Polyester film neither expands nor con-

(*Continued on page* 33)

Cronar Film Improved

"Cronar," DuPont's new film base, recently underwent a second series of tests in a number of theatres in the Los Angeles area. Reports from projectionists who participated in these tests indicate a definite improvement in Cronar.

Readers of the November 1955 issue of IP will remember an account of an earlier field test of Cronar conducted about a year ago. At that time a number of projectionists criticized the new film base because of a tendency to flutter out of focus when projected with powerful arc lamps.

Following further research at DuPont laboratories, a second set of field tests were undertaken. The test consisted of putting special prints of the film, "Desperate Hours," composed half of Cronar base film and half of standard acetate base, through all the strains of everyday use in the projection room.

Commenting on the tests, Paul Mahoney, assistant business manager of IA Local 150 in Los Angeles, states that reports from projectionists in several theatres where the test print was used were highly favorable, "especially with regard to the brilliancy of light and focus in equality to the acetate sequences."

Projectionist Ted Pylet, of the Hawaii Theatre in Hollywood, who criticized the focusing aspect of Cronar film following the earlier trial, reacted differently after the more recent run. "The tendency of the film to go in and out of focus which I noted in the previous test last year, using a print of 'Country Girl,' has been eliminated."

Projection Advances On the Way

By HERBERT BARNETT

General Precision Equipment Co.

Faster intermittent movements and curved gates may become available for presently installed equipment, an expert predicts in examining the future of wide-screen projection.

THE FEVERISH activities of recent years which stirred this industry to its foundation are now largely past history. Impact of these, however, are still largely with us. It is not believed we are yet in a position to weigh the benefits and evils of this era.

There is no question the film industry was faced with a period of recession of serious proportions. The introduction of Cinerama and 3-D stirred the imagination of technicians to bring forth innumerable proposals for improvement in picture presentation. Some of these were well founded and many were not. Never before had the engineer and engineering principles so thoroughly contributed material for the promotion departments. Technical terms previously confined to the laboratory became commonplace in commenting on film presentations. Audiences quickly became more aware of picture and sound quality.

We have often wondered as to whether greater and more lasting benefits may have resulted if coordination of this tremendous effort could have been effected to result in a standardized system encompassing the best of all the proposals. Undoubtedly much more time would have been required. We may have achieved an ideal system at less cost, but too late to have halted the recession. Unfortunately, the sudden appearance of engineering in a position of prominence completely obscured its role in quietly contributing a steady flow of technical improvements during the period from sound to wide screen.

Excessive Magnification

Among the more important innovations recently adopted and which appears to be here to stay, is the concept of increased screen dimensions. As desirable as this larger picture area may be, it has brought with it several undesirable features which engineering must eventually correct. The most important of these is loss of picture quality through increased magnification of the 35-mm frame.

Recognizing this fact, several of the Hollywood studios are experimenting with wider film through which more picture information (increased resolution) can be achieved. As was true in the case of many recent proposals, there is lack of agreement as to optimum width increase. Logical arguments can be advanced by each interested group as to its preference and, in most cases, these are based upon convenience in translation to the desired 35-mm standard. Fundamentally, wide film considerations relate to photography and the gains in picture quality to be realized through increased frame size. Possibilities of projection in these new dimensions are yet to be determined.

Two wide film systems have been proposed and developed to the point that productions are being photographed in these new dimensions. One is the 20th Century-Fox 55-mm film which provides a frame size twice the linear dimensions of the standard CinemaScope frame — four times the area. Through direct reduction, therefore, release prints in standard CinemaScope are provided. It is possible through this procedure to retain in the release print much of the quality gains afforded by the larger negative area. The film "Carousel" is the first to have been photographed in 55-mm and released in 35-mm CinemaScope. Others, including "The King and I," will follow shortly.

Somewhat equivalent progress in application of 65-mm film has been made by MGM and Columbia Studios. Tests have been completed which justify to a satisfactory degree decisions to proceed with programs employing the wider film. MGM has announced the production of its first feature photographed on 65-mm negative.

Again, as in the case of Fox, the primary purpose is to achieve increased picture quality through the medium of larger frame size. Attention is being given to adequate flexibility to permit adaptation to wide screen projection from 35-mm prints.

The degree to which improved picture quality can be maintained in transfer to 35-mm release print will determine the merits of such procedure. Reasonable success has been indicated in material released, and it is to be expected that considerable improvements will be possible through continuing development. Many costly problems in printing, lenses and other elements must be faced by the studios who are pioneering in these fields.

As successful as these developments may be, it is not likely that all the quality available on wide negative will be realized on 35-mm release print. Additionally, continued use of 35-mm prints means other limitations which handicap quality projection remain. One of the more important of these is inadequate screen illumination in connection with larger screens. In most instances the limiting factor with respect to light is film buckle, resulting in out-of-focus conditions sufficient to seriously reduce picture quality.

The problem of light is most serious in drive-in theatres and the relatively few larger indoor situations. It will be impossible for theatres in these categories to realize fully the improvement which will be available on the 35-mm print until adequate improvement in screen illumination is available.

One of the more logical means by which the problem of light may be solved is through adoption of wider release prints. There is an additional plus factor in that a larger percentage of negative quality would be retained in the print.

Before mention of wide film release may be misinterpreted may I reassure you that there is no intent on the part of anyone to force the acceptance of change in film dimensions by conditioning availability of product on your ability to accept the wide print. Having been close to this work, I can assure you that one of the basic requirements has been that, whatever the intermediate process, ability to release in 35-mm must be assured. Therefore, no one should fear he will be forced to purchase non-standard equipment due to wide film developments.

Needs of Large Theatres

There is much to be said, however, for the application of wide prints in drive-ins and indoor theatres employing screen widths greater than 40 feet. Notable increase in screen illumination, as well as in picture quality can be realized.

The question as to eventual release in wide film versions is a rather complex one and no conclusion has been reached at this time. It has been demonstrated that the wide print can be produced, but it must be realized costs will be considerably in excess of 35-mm release prints. Projection equipment can be provided by several manufacturers and preparations to produce wide film equipment is

(*Continued on page* 32)

SMPTE Convention Stresses Standards

By JAMES MORRIS

Perfecting and standardizing wide-screen processes were the main projection activities of engineers' group. TV got most attention.

PROJECTIONISTS who attended the recent convention of the Society of Motion Picture and Television Engineers at the Hotel Statler in New York City probably felt a little lonely surrounded by the array of studio camera equipment and TV broadcasting apparatus confronting them on the exhibit floor. Most likely, they were also somewhat disappointed by the fact that most of the papers read at the convention were concerned either with TV or with studio or laboratory techniques.

One reason for this situation is the bustling, dynamic quality of the TV industry which is referred to on the editorial page of this issue. Another and more subtle reason is a change that has occurred in the technical outlook of the motion picture industry. Although experiment continues, hysterical pursuit after new processes is just about over. The value of some have been proven and others have been discarded.

The emphasis now is on standardization of techniques so far as the average theatre is concerned. New projection and sound equipment of radical design will continue to reach the market, but an overwhelming proportion of it will be directed at large big-city theatres with two-a-day "roadshow" presentation policies.

Aid for Projectionists

In a move to aid projectionists and exhibitors who are experiencing difficulties in adjusting their theatres to wide-screen projection, the Education Committee and the Projection Practice Committee of the SMPTE both voted to consult with leaders of the projectionist craft and exhibitor groups on ways in which the SMPTE could help in solving projection problems. The action of the Education Committee was in line with the previously announced plan of the society to inaugurate a nationwide education program to assist projectionists in getting the most out of modern theatre equipment. The projectionist program was scheduled to follow an expansion to New York City of a series of courses for studio and laboratory technicians begun last fall on the West Coast.

Unfortunately, action in establishing the new studio and lab courses has been slowed by organizational problems such as difficulty in obtaining experienced leadership within the industry and among educators. The courses in Los Angeles are held under the joint sponsorship of three organizations, the SMPTE, the studio branches of the IATSE, and the University of California in Los Angeles.

Despite present difficulties, the Education Committee will work to stimulate greater interest and get the courses under way in New York. Because of the need to concentrate present efforts on the second stage of the SMPTE's education plan, no further action could be taken during the convention to promote the training course for projectionists.

One of the biggest problems to be solved is in the method of presenting the projection course which is conceived of as a nationwide program available to all projectionists rather than as a course available to the limited group in one or two large metropolitan centers such as New York or Los Angeles. The only concrete action taken thus far has been to contact IA Local officials in various areas to sound them out on how and by what means such training might be presented. It was noted that obtaining leadership for planning and setting up the projectionist course will also be difficult.

Acting on a proposal made during the Allied States Association Drive-in Convention in Cleveland last February, the Projection Practice Committee of the SMPTE voted to cooperate with this exhibitor group to study and attempt to solve projection problems which Allied describes as resulting from "too many apertures and too many aspect ratios." Allied also complained about excessive density of prints.

Accent on Standardization

As previously noted, the accent is now on standardization for equipment used in the average theatre and aperture problems are therefore tending to solve themselves. One member of the Projection Practice Committee commented after the meeting that the action of the SuperScope organization in changing their odd-sized square aperture to conform to the more common aperture used for optical-track CinemaScope prints was a step in this direction. He added that other projection problems such as those brought about by great magnification of screen images and excessive heat in projectors and on film presented the real problems to standardizers.

When questioned about the complicated question of altering the customary density of prints, another member of the Projection Practice Committee stated that people who suggest that prints be produced in lighter density or in varying density to suit different types of indoor and outdoor projection setups do not consider all aspects of the problem. Color is degraded if density is lowered, he said. Black-and-white prints, which are most often complained about, lose much of their contrast and tonal values if made too light.

Questioned about the possibility of

Boyce Nemec Leaving SMPTE

BOYCE NEMEC, executive secretary of the Society of Motion Picture and Television Engineers, is resigning next month to establish a management consulting service with headquarters in the East. The firm will specialize in problems such as corporate structure, cost analysis and market studies in the motion picture and TV industries.

Joining the SMPTE in 1946 after discharge from the Signal Corps., Nemec served 1½ years as engineering secretary assigned to modernize the Society's standardization procedures. In 1947 he became executive secretary and held that post during the Society's expansion into the fields of wide-screen motion pictures, TV and high-speed photography.

film laboratories making two types of prints, fairly light ones for drive-ins and darker prints for indoor theatres, he pointed out that the process of adjusting and timing complicated printing machinery to accomplish this would be cumbersome and costly. He further asserted that the existence of two types of prints would create unsolvable problems for the exchanges, and that booking requirements might result in drive-ins getting the same dark prints that they object to now, while indoor theatres would often be stuck with prints producing a washed-out screen image.

He admitted, however, that increased brightness was more important than image contrast at most drive-ins, and predicted that Hollywood will pay increasing attention to their needs.

Closed-Circuit Boom

Reading of papers on the fast-growing field of closed-circuit and industrial TV, as distinguished from television broadcasting, was an important part of the convention program. Projectionists who are familiar with closed-circuit TV equipment through its use in theatres for the showing of prizefights and similar entertainment will be surprised to learn of the enormous variety of uses to which small portable TV projectors and cameras are being put by schools and industry.

"The simplest of closed-circuit cameras," according to John R. Howland of Dage Television, one of a number of firms now producing this equipment, "is entirely self contained in less than 300 cubic inches, weighs less than 10 pounds, and costs less than $1,000. Between complete broadcast cameras and simple closed-circuit cameras, units with many degrees of complexity are available."

Among the new uses for closed-circuit TV mentioned by Mr. Howland in his paper were transmitting signatures, ledger cards and records, observing machinery functions, guarding against pilferage, monitoring traffic movements, inspecting wells, pipes, atomic reactors or cockpits of test planes and even enlarging and displaying the field of a microscope.

Military uses for closed-circuit TV were explained by Colonel Norman Gray of the Army Pictorial Center in New York City. He reported that TV had been found useful for reconnaissance and surveillance, fire control as well as for the transmission of data and for the holding of command conferences. A TV system can be mounted in light aircraft, tanks and jeeps where it provides immediate visual information about movements not only at the front line but behind enemy lines. Compact and rugged military TV equipment of light weight has been developed, he said.

Another speaker described how closed-circuit TV is helping to solve a major educational problem—the shortage of competent teachers.

The keynote speech of the convention, in which he declared that the "cold war" was ended between the motion picture and television industries, was made by Dr. John G. Frayne, president of the Society and Hollywood manager of the Westrex Corp. He asserted that recent sales of close to 2,000 feature pictures for TV use and the production of film for TV by "almost every major studio in Hollywood" indicates that attitudes have changed among producers.

Technical Cooperation

Dr. Frayne credited the SMPTE with helping to bridge a technological gap between the two industries "by offering to technical specialists in both areas a common technical forum of long standing and experience." He stated that to the engineer motion pictures and TV have long been closely allied and today are considered inseparable.

Noting that SMPTE members were interested in TV many years before the Society's name was changed from Society of Motion Picture Engineers in 1950, Dr. Frayne remarked that the first paper on TV was presented before the society in 1923 by C. Francis Jenkins, its founder.

Although an actual merging of the techniques of motion picture production and television broadcasting in the form of tape recorded pictures was recently predicted by some, this was denied in a paper read by Charles P. Ginsberg, chief video engineer of the Ampex Corp., which described the general features of the new Ampex Videotape Recorder and explained its exact area of usefulness.

It might be possible for a motion picture director to shoot scenes simultaneously in film and in Videotape and immediately review the tape recording while his cast and sets were still assembled. "This procedure could," Mr. Ginsberg asserted, "reduce production time and costs in movies." However, since video quality is "simply not comparable with film, and not even remotely comparable to the new larger-negative film processes," he reported he saw no immediate use for the picture-on-tape process in the studios and very little in the future. The machine is designed for the picking up of network TV programs that must be "stored" because of time-zone differences or program scheduling.

Technicolor Improves Color Printing Process

The Technicolor Motion Picture Corp. recently announced a more efficient method of color printing. The new method, like the one used by Technicolor from 1932 to 1954, is a three component dye transfer imbibition process; however, the newer version embodies a number of important changes said to greatly improve quality. In addition to regular 35-mm printing, the improved process is applicable to wide gauge negatives with or without the anamorphic "squeeze."

The three basic changes in the recently developed method are a new matrix stock, a new blank stock, and an improved optical printing procedure. According to Herbert T. Kalmus, Technicolor president, large area (wide gauge) negatives that have undergone the improved process have resulted in prints of "excellent visibility, definition, graininess and depth of focus."

It was announced that any of the currently employed large area negatives such as 65-mm, 55-mm, and 8-perforation double frame 35-mm can satisfactorily be put through the new printing process. When an anamorphic lens is used on the camera, the Technicolor printing apparatus may be adjusted to turn out whatever type release print is desired. It was claimed further that where anamorphic prints are needed, distortion is reduced to a minimum because the "squeeze" occurs partially in the camera and partially in the printing system.

At a recent demonstration in Hollywood of the improved process, Technicolor technicians claimed better quality prints as well as lower production costs. Refined definition, greater depth of focus, and more balanced color were some of the reported advantages. In addition, savings of one-half to one cent per foot can be realized on release prints via the new method.

Brushup on Fundamentals

A monthly department devoted to questions and answers on technical subjects that affect the projection craft.

How much do we know about electricity?

This question seems to be a very simple one to answer, and yet a complete answer never has been given. A famous scientist stated not so long ago that 96% of our knowledge as to the true nature of electricity has not been expounded to date. The phenomenon that is electricity has been known to civilized peoples for many centuries. The ancient Greeks discovered that when an amber rod was vigorously rubbed on a piece of cloth it acquired the property of attracting to it small pieces of paper, cloth, dust, and other non-metallic substances. It is from the Greek word "electron" meaning amber, that the word "electricity" was derived.

What is the connection between electricity and matter?

Although our knowledge of electricity is limited to some extent, we have been able to find out a great deal about its nature, its effects, and its applications. We know, for example, that all forms of matter contain some electrical charges. But what is matter? Everything that goes into the make-up of our universe may be classified as matter. The air that we breathe, the water that we drink, the ground that we walk upon, all are considered to be what we call matter.

Matter exists in three fundamental forms, or "states," as they are called by scientists. The three states of matter are (1) the solid state, (2) the liquid state, and (3) the gaseous state. The application of varying degrees of heat to matter will result in a change of state taking place.

Let us first consider a piece of ice (matter in the solid state). When the ice is in physical contact with any body that is warmer than 32 degrees F., it will slowly begin to melt until it turns into water. A change of state has taken place and the solid piece of ice has now turned into a liquid. Any further application of heat will have little effect upon the state of the liquid, until enough heat is added to cause the water to become vaporized.

When the water has begun to vaporize, it will turn into steam, and we know that steam is a gas. The reason why these changes take place in various kinds of matter is because changes take place in the tiniest particles from which matter is composed. The number and arrangement of these extremely small particles is responsible for the existence of many different kinds of matter, all reacting in their own way to the influence of electricity.

What are atoms, molecules and electrons?

All matter is made up of 92 fundamental constituents called elements. Matter made up of only one element is said to exist in the free state. Examples of free elements are iron, copper, carbon, tungsten, aluminum, radium, gold, and silver. These free elements may be broken down into very minute particles, so small that billions of them could be placed on the head of a pin. The smallest particle which still retains all the original characteristics of an element is called an atom.

Some types of matter are combinations of free elements and these are called compounds. Examples of compounds are air, water, brass, steel, and bakelite. Air and water are made from two free elements, hydrogen and oxygen; while brass is composed of copper and zinc. The smallest particle of a compound which still retains all of the original characteristics of that compound is called a molecule.

What is the nature of electricity?

The most modern theory of the nature of electricity is based upon the structure of the atom. An atom consists of a heavy central part, called the nucleus, around which very tiny particles of electricity, called electrons, revolve. Reference to Figure 1 will show a simplified picture of an atom. Most of the weight of the atom is contained in the central portion (nucleus).

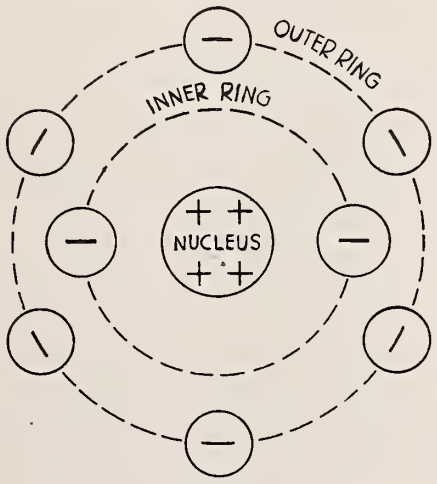


FIGURE 1

The atom may be compared to the solar system. We all know that the earth and all the other planets of the universe revolve in elliptical orbits (paths) around the sun. Some of the planets move in paths which are close to the sun, while others move in orbits very distant from the sun. The nucleus may be considered as the sun, and the tiny charges of electricity as the planets. Those charges which follow paths that are near the nucleus are tightly bound to the atom and can only be removed by the application of tremendous pressure, while the charges which are further removed from the center of the atom can be made to leave the atom by the application of relatively small pressures. Commercial electricity is possible only because some electrons can be forced to leave their atoms.

What is the difference between static and dynamic electricity?

Now that we have discussed the construction of the atom, let us investigate its electrical characteristics. The nucleus was found to contain an electrical charge which was unlike the electron. Scientists called this charge positive, and designated it with a plus sign (+), while the electrons were called negative charges and were designated by a minus sign (−). Also, the positive charges are sometimes called protons. An electron is, by definition, the smallest possible charge of negative electricity.

Electricity exists in two forms, static and dynamic. Static electricity is electricity at rest, while dynamic electricity is electricity in motion. Electric power of the type used in our homes, regardless of whether we use alternating or direct current, is electricity in motion, and, therefore, dynamic electricity.

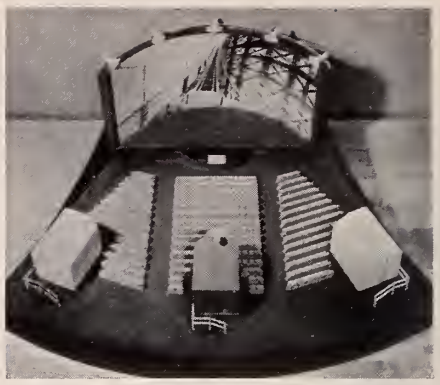
When a person walks on a heavy rug he usually will generate static electricity due to friction between his shoes and the rug. If he should pick up a telephone or other metallic object he would experience an electric shock because the charges generated at the rug would discharge through his body. This type of electricity is at rest, because once discharged it disappears, unless more friction is applied to the rug. Static electricity is easily created by friction. The voltages generated by friction can be very large and will sometimes cause a large spark to jump between two points,

(*Continued on page* 32)

The premiere of the new Cinerama feature, "Seven Wonders of the World," coincides with plans to show the oldest and most spectacular of the new processes in additional cities.

Four Years of Cinerama

By NORMAN WASSERMAN



Model of a typical Cinerama installation with the three projection rooms located on the orchestra floor. Position of the control console may vary with each Cinerama theatre. At the Warner Theatre in New York the control console is located directly in front of the center projection room.

IT WAS on September 30, 1952 that Cinerama's first production, "This is Cinerama," burst like a bombshell in the middle of a relatively dormant movie scene. Deservedly, "This is Cinerama" received praise from all quarters, but perhaps even more important, it was the recipient of a flood of cash reservations. The public went wild over this new widescreen-stereophonic-participation process and carried "This is Cinerama" on a crest of success for more than two years.

The second Cinerama feature, "Cinerama Holiday," made its bow at Warner Theatre in New York in February, 1955. This new version showed definite technical improvements over its predecessor and was also considered artistically superior. Nevertheless, "Cinerama Holiday" only managed to survive about one year in New York—about half the run of "This is Cinerama."

We wonder just how significant this is. We wonder more in the light of Cinerama's most recent offering—"Seven Wonders of the World," which showed even further technical advancements. However, reviewers who were ecstatic over previous Cinerama features were somewhat reserved in their praise of this latest offering. Could it be that the thrill and charm of this unique projection process is beginning to wear thin? Let us go over the development of Cinerama and try to find out.

Waller Gunnery Trainer

It all stated back in the time of World War II, when Fred Waller, at one time associated with Paramount Pictures, designed the famous Waller Gunnery Trainer for the purpose of teaching Air Force personnel how to identify enemy aircraft and shoot them down. This military system consisted of a five-lens camera that filmed the airplanes, while five projectors projected the processed film onto a wide curved screen, thereby achieving a high degree of realism.

This, then, is the core of the Cineramic process as we know it today. Cinerama uses a three-lens camera for filming, which has proved sufficient. And as might be expected, three projectors are also used. A sound recording and reproduction system was developed by Hazard E. Reeves, of Reeves Sound Studios in New York City, which was combined with the visual aspects to round out the process into a complete system.

There have been some who have called Cinerama "the most impressive audio-visual medium around" and "the most realistic in terms of audience participation of all the new giant screen processes," to mention just a few of the kudos lavished upon it. Such praise cannot be denied. The spontaneous "Ohs" and "Ahs" of surprise and pleasure that have been heard among audiences, together with an occasional expression of oncoming nausea (roller-coaster, bobsledding, and a run-away train down the side of a mountain) are sufficient proof of its ability to draw spectators right into the action on its "wrap-around" screen.

Cinerama Projection

Most projectionists are probably familiar with the physical functionings of the Cinerama process. Suffice us here to make a simple rundown of the more important aspects of the operation, without going into too much detail.

There are, of course, the three projection rooms, more or less on a level with the screen, located on either the auditorium floor or raised to mezzanine height. Each projector flashes its beam across the beams of the other two projectors to a one-third area of the deeply curved screen. All three projectors are synchronized by a control console. Sound reproduction comes off a separate film which contains seven magnetic tracks amplified to speakers strategically placed behind the screen and along the walls of the theatre. The screen itself, although it gives the impression of being absolutely solid, is composed of narrow strips of tape which overlap and are angled in such a way as not to reflect light to other portions of the screen.

Needless to say, synchronization is most important, and it is here that Cinerama has encountered most of its technical difficulties. In an otherwise enthusiastic appraisal of the Cineramic process that appeared in the October 1952 issue of IP, the following points were raised: (1) horizontal lines were seldom straight due to the deep curvature of the screen (largely dependent upon viewing location); (2) the two vertical junction lines where the three component panels meet on the screen were often very much in evidence; (3) there was an apparent projector jump or vertical vibration; (4) the illusion was marred when one of the projectors got out of frame and had to be reframed with respect to the other two; (5) projection light on the three screen panels sometimes differed in brightness and color tone; and (6) horizontal lines taken from a panning camera and projected across the length of the screen "jiggled" as they passed the junction areas between panels.

Technique Has Improved

It should be remembered that these criticisms were directed at Cinerama nearly four years ago, when the process first came out. Today, however, Cinerama's technicians have improved the process to the extent where most of the aforementioned points no longer apply.

For example, in the currently run-

ning "Seven Wonders of the World," practically all picture critics commented on the progress made toward eliminating the vertical lines where the projection beams meet on the screen. This was accomplished by means of improved "giggolo" side apertures. The giggolos enable the picture panels to mesh less obviously on the screen than would straight apertures, which would produce very obvious vertical black lines in two different places on the screen.

Though far from perfect, overall synchronization of the three projectors has been greatly improved for "Seven Wonders of the World." Reframing during the performance is hardly necessary. Vertical jump is still somewhat distracting, but less so than formerly, and horizontal lines seem straighter. The difference in color shadings from one panel to the other are only slightly evident and then only when a bright scene such as a desert or sky is being projected; in the darker sequences such shading differences are not even noticeable. There is still perspective distortion from the side seats, and from the seats in the rear of the auditorium one loses some of the participation effect.

Cinerama sound is excellent. The loudspeakers, five behind the screen and four distributed throughout the auditorium, are all strategically placed, and more important, carry just the right pitch and content for their particular locations.

Portable Installations

An interesting development in Cinerama's mode of exhibition is the recent mobile installation at the Roxy Theatre in Atlanta, Ga. Described as "portable," the Atlanta setup took two weeks to install, while dismantling time has been estimated as one week, if and when it becomes necessary. The important thing, however, is the apparent success of the operation, indicating that Cinerama can and probably will be shown in more and more theatres throughout the world.

From the projectionist's point of view, such mobile installations require a very minimum of five men to a projection crew. These usually are local men who go through a training course in Cinerama's techniques for about four days, followed by another four-day period of actual operation under the supervision of experienced personnel. From then on the men are on their own in presenting the show.

Here is how the crew functions: one man in the regular projection room operates the sound for Cinerama as well as the 35-mm projector for the brief prologue; one man works in each of the three portable Cinerama projection rooms; and a fifth man operates the control console. There are two such five-man crews, operating alternate shows (there are two daily), with each crew having its own print.

Each projectionist sets up his machine in exact alignment with the other projectors. Manual operation reverts to remote control by a flip of a switch which lights an indicator on the control console. On orders transmitted from the console over a small speaker system, each projectionist opens the dowser, completing transfer of the control of all projectors to the man operating the console. Control of the sound track is passed on to the console in a similar manner. The console projectionist thus becomes the key man in the team as he throws the control switches which set the four separate pieces of equipment (three projectors and one soundhead) into operation.

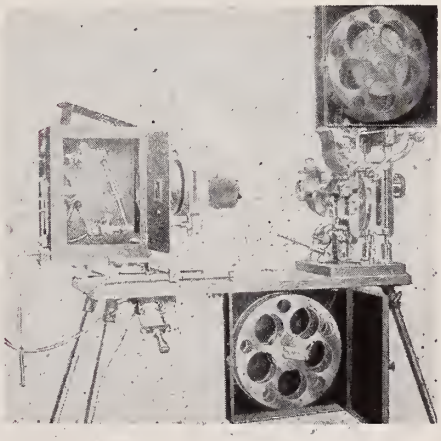
Cinerama is easily the "granddaddy" of all the widescreen processes. It is certainly the most effective in terms of audience participation. Stereophonically speaking, it is on the top of the heap. The question now is—how long can it maintain its superiority? Well, a partial answer is: until another process comes along and usurps its position, which doesn't seem very likely in the near future.

Ray Brian—Philoprojectormaneologist

A MAN who loves to collect stamps is called a philatelist, an avid devotee of the ballet is known as a balletmane, while someone who studies ancient fossils is a paleontologist. Now, how about the man who is devoted to the study and collection of projection data? Is he a philoprojectormaneologist? Let's just call him Ray Brian.

"Professor" Brian is a member of proud Local 434 of Peoria, Ill. His hobby is projectors and he has amassed an enviable amount of information on the subject, including thousands of photographs. For many months, IP has been bringing readers of this page brief samplings of Brian's collection. We will happily continue to do so until every item has been listed.

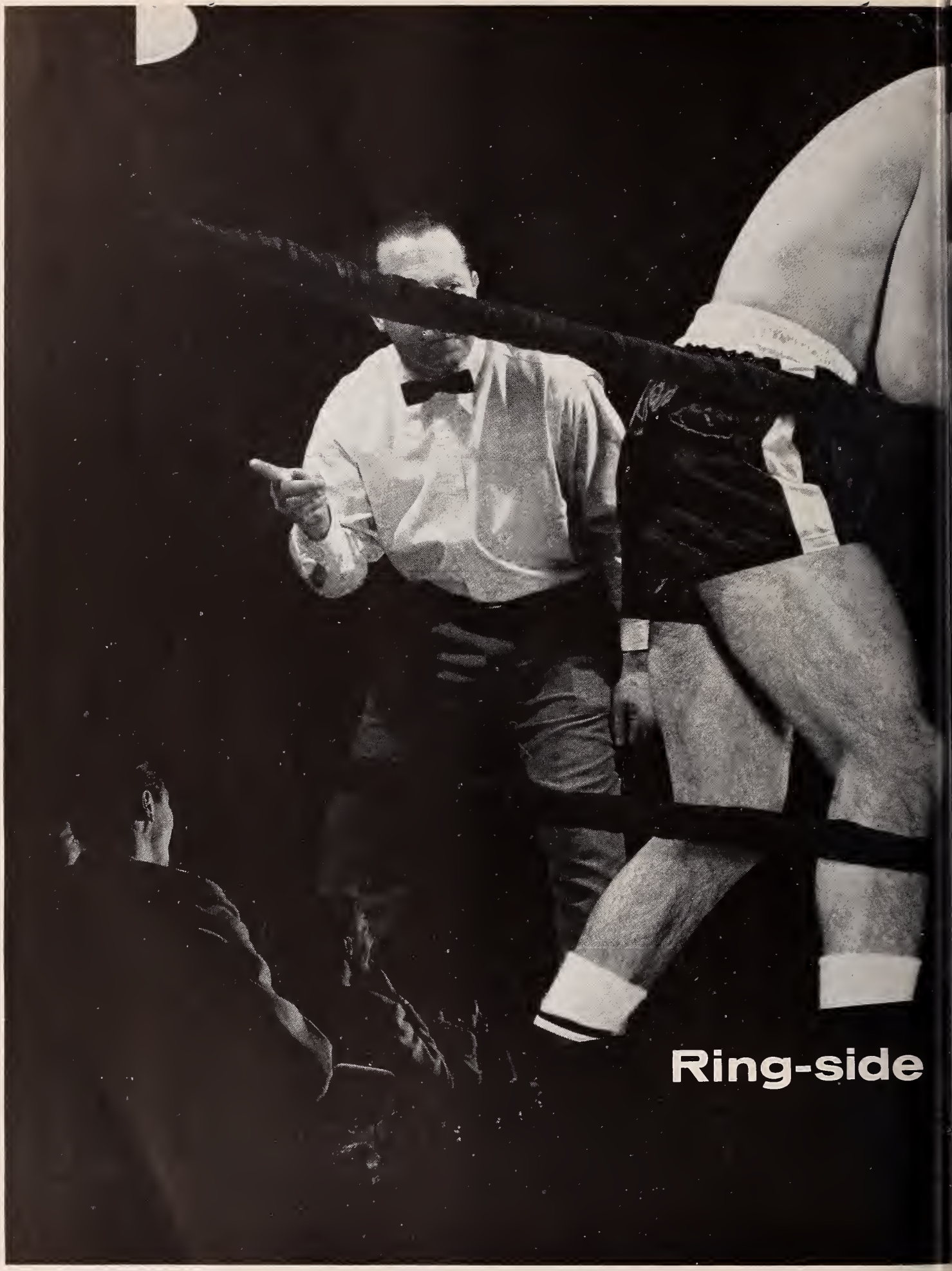
Like any true philoprojectormaneologist, Brian is always on the lookout for new additions. Readers in possession of such information are urged to contact IP. Following is the current month's installment taken from Brian's "Movieana" archives. With the exception of those items marked with an asterisk, the collection includes photographs of all the projectors named.

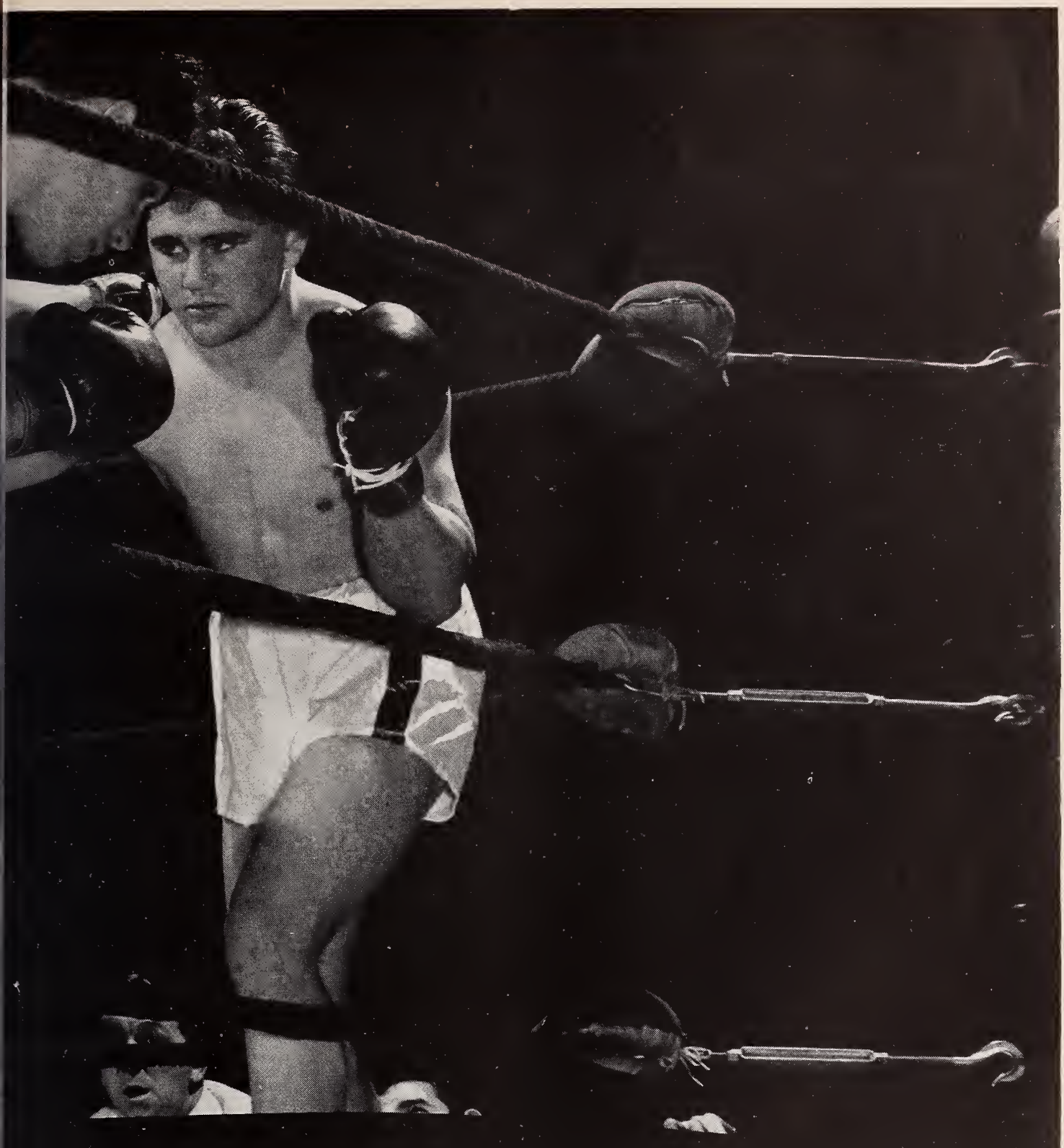


Power's No. 5—about 1910.

A two-year free subscription to IP will go to the first man coming up with a photo of the Photokinematograph.

PHOTOPHONE—RCA, 1928.
PHANTOGRAPH—made about 1900.*
PHANTOSCOPE—C. Francis Jenkins, 1895 to 1912.
PHEBUS—made in France, about 1931.
PHILIPS—made in Eindhoven, Holland.
PHILISONOR—Philips Electric Co., Calcutta, India, 1954.
PHOTOCINEGRAPHE—*
PHOTOKINEMATOGRAPH—about 1900.*
PHONOMENDOSCOPE—about 1900.*
PHOTOMOTOSCOPE—about 1900.*
PHOTOROTOSCOPE—built by Hughes in 1899.*
PHOTOTACHYGRAPHE—made in France by Crimoin and Sanson.*
PHOTOTROPE—made about 1900.*
PIETZSCH—made in Philadelphia, Pa., R. Pietzsch & Co., 1903.
PICTORIALGRAPH—made by Rowe in 1900.*
PICTUREGRAPH—made in Newark, N. J., 1913.
PICTURESCOPE—made by Chas. Dressler, 1910.*
PIROU—made about 1900.*
PORTOSCOPE—Motion Picture Scope Co., Chicago, Ill.*
POWER'S — "Cameragraphs," N. Power Co., 1906 to 1925.
PRECISION—Simplex Photo Products Co., Long Island, N. Y.
PROJECTOSCOPE—Edwin Kuhn and Chas. Webster, 1896.
PROJECTOGRAPH — American Projectograph Co., Chicago, Ill., 1906.
PRESTWICH—made in England in 1899.
PROCTOR — United Theatre Equipment Co., 1920.
PREVOST—made in Italy, 1931.


Ring-side



...world-wide!

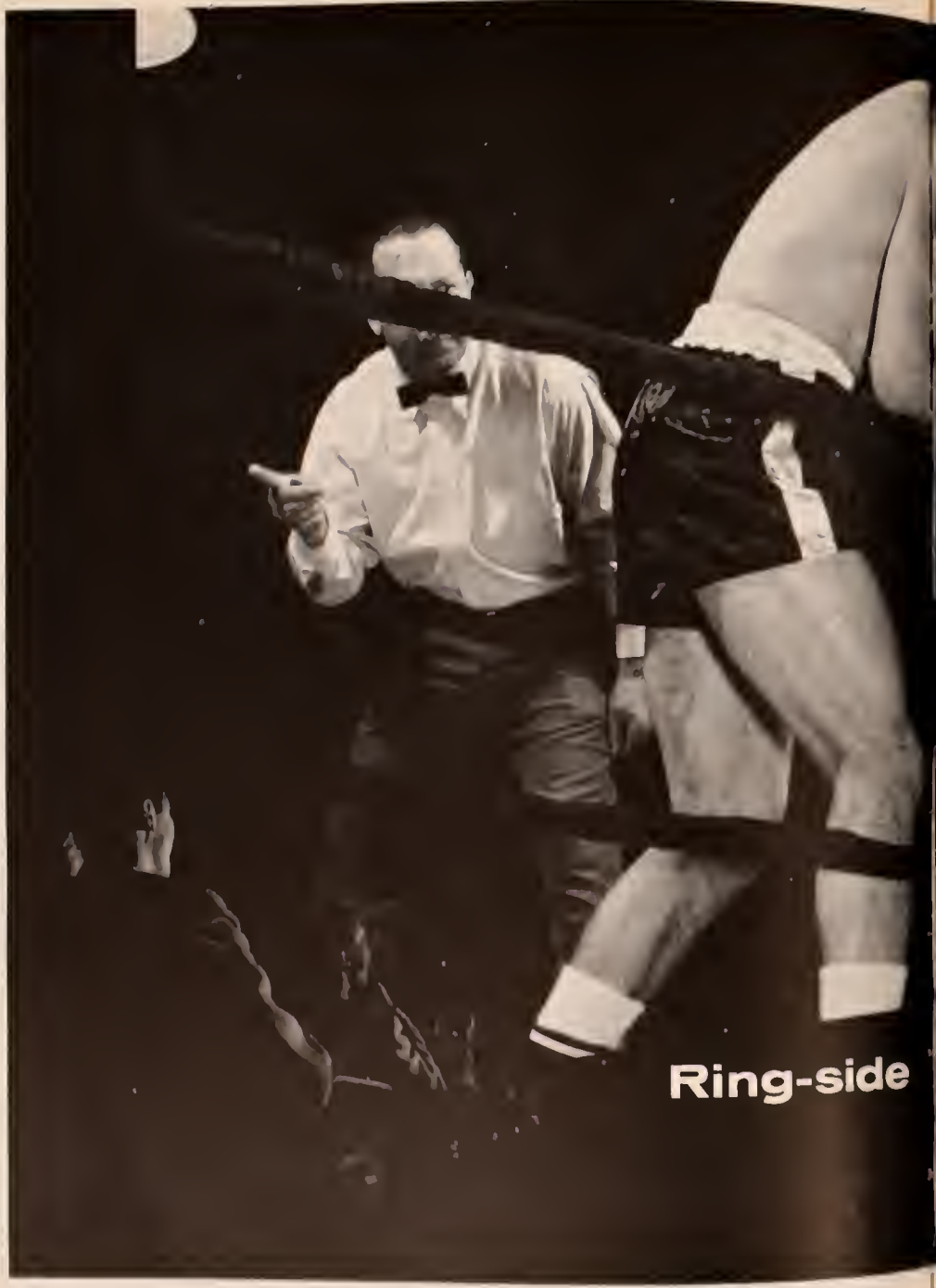
Everybody thrills to a fight! Especially when it's on a wide, wide-screen where every seat is down front! Before this show could go on in this way, time, work, and money went into perfecting new technics in production, processing, and projection. Members of the Eastman Technical Service, working hand-in-hand with the industry, are happy to have helped develop these technics.

Motion Picture Film Department
EASTMAN KODAK COMPANY, Rochester 4, N. Y.
Branches at strategic centers. Inquiries invited.

East Coast Division
342 Madison Ave., New York 17, N. Y.

Midwest Division
137 North Wabash Ave., Chicago 2, Ill.

West Coast Division
6706 Santa Monica Blvd., Hollywood 38, Calif.



Ring-side ...world-wide!

Everybody thrills to a fight! Especially when it's on a wide, wide-screen where every seat is down front! Before this show could go on in this way, time, work, and money went into perfecting new technics in production, processing, and projection. Members of the Eastman Technical Service, working hand-in-hand with the industry, are happy to have helped develop these technics.

Motion Picture Film Department
EASTMAN KODAK COMPANY, Rochester 4, N. Y.
Branches at strategic centers. Inquiries invited.

East Coast Division
342 Madison Ave., New York 17, N. Y.

Midwest Division
137 North Wabash Ave., Chicago 2, Ill.

West Coast Division
6706 Santa Monica Blvd., Hollywood 38, Calif.

In The SPOTLIGHT

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

THE past year or two saw labor scoring significant gains in urging that social security benefits, unemployment insurance rates, and minimum wages all be revised upward to fit in with the needs of the modern worker. Of special importance to the readers of these columns are the changes that have resulted in the social security laws.

The Social Security Act now permits a person who is receiving retirement benefits to continue working on a part-time or seasonal basis and still receive all or at least part of his retirement income. What this does in effect is to shelve the restrictive concept of "total retirement" in favor of the more reasonable state of "partial retirement" — so that a still active old-timer can do some work at certain intervals and then rest his weary bones the rest of the time and not necessarily jeopardize his social security benefits.

It works like this: If you earn $1200 or less in a calendar year you are entitled to all of the 12 monthly retirement checks from social security. On the other hand, if you work throughout the year and earn more than $1200, then for each $80 or fraction of $80 over $1200 you lose one month's retirement benefit. However, regardless of how much over the $1200 you earn in the calendar year, you can still receive social security payments for each month in which you earned less than $80 in employment or do not render substantial services in self-employment. For those who are eligible, it is wise to keep a careful record of all monthly earnings and self-employment activities.

For example, a man could earn several thousand dollars some months of the year (seasonal projectionists take note) and still be eligible for social security checks for other months in which he earns nothing or less than $80.

• A record-breaking crowd of almost 400 people assembled at the Hollenden Hotel in Cleveland, Ohio on April 17 last to witness the burning of the mortgage on Cleveland Local 160's headquarter building, which was completed in 1949 and is valued at $85,000. The Local's headquarters consists of business offices, and has a spacious recreation area which is fully equipped for all membership activities.

A midnight banquet and dance followed the mortgage burning ceremony in which IA President Richard F. Walsh; Harland Holmden, IA secretary-treasurer and former business representative for Local 160; and Perry Carter, present business representative for the Local, participated. John Shuff (Akron, Ohio), IA 8th vice-president also witnessed the ceremony.

Among the invited guests were exhibitors representing the chain circuits, independents, and drive-in theatres in the Cleveland area.

A highlight of the evening was the presentation of a diamond studded gold life membership card to Perry L. Carter in appreciation for his unceasing efforts on behalf of the Local. Perry has been a member of the Cleveland Local since 1916. In 1946 he was appointed member of the board of directors and was elected president of the Local in 1950. He has held the office of business representative since 1952.



Perry Carter (center) holding the martgage an Cleveland Lacal 160's headquarter building while IA President Richard F. Walsh (left) and General Secretary - Treasurer Harland Holmden apply the matches. This burning ceremany marks the retirement af a seven-year martgage on the building.

• IA President Walsh attended the Union Card and Label League Shows held at the Civic Auditorium in Seattle, Wash., April 20-25.

• Harry Garfman, Brooklyn and Queens business representative for N. Y. Local 306, is noted for his many activities in behalf of underprivileged youngsters. He was recently appointed chairman of the Motion Picture Industry for the Cystic Fibrosis Association. In an endeavor to raise funds for the unfortunate victims of this baffling disease, Garfman has recently completed arrangements for a gala event to be held at the Randforce Congress Theatre in Brooklyn at midnight on Friday, June 22, next. This was made possible by the splendid cooperation of Sam Rinzler and Emanuel Frisch of the Randforce Amusement Corp.

• West Coast studios have long been known to boast of such all around geniuses as the producer-writer-director, but we'll bet a pocketful of sprocket holes that they don't have many producer - director - cameraman - film editor-projectionists out there. But the proud populace of Port Dover, Ont. *can* boast of one in the person of Ed McCormick, projectionist at the Beach Theatre there and member of Brantford (Canada) Local 582.

Being the shy type, McCormick only recently informed us of his exploit last summer when he not only filmed the town's annual July first parade in full color, but edited both the film and sound, capping the whole deal by running the picture to delighted capacity audiences at

the Beach Theatre, many of whom came to see themselves on the screen. The feature ran for 15 minutes and was heralded by the local press with banner headlines and a front page write-up. McCormick stated that advance publicity had "leaked" out beforehand, which, of course, brought on the displays in the newspapers. (Well, well, a projectionist-publicist, also.)

Assisting McCormick in this project was Bob Magill, also a member of the Brantford Local. The equipment used consisted of a synchronized tape-recorder; five turntables, fifteen effects recordings, and four band recordings, together with traditional music for various folk dances filmed at the parade. A total of seven hours was spent in the projection room with what McCormick calls "this Rube Goldberg nightmare hookup," until a satisfactory tape recording was finally achieved and the production hit the screen right on schedule.

The townspeople were so pleased with McCormick's efforts, that they have asked him to film this year's annual parade in addition to other local events.

• District No. 10, comprised of New York State IA Locals, held its biennial dinner at the St. George Hotel, Brooklyn, on Saturday, May 5. IA President Richard F. Walsh was one of the three guests of honor. Cited along with Walsh for their contributions to labor-management-government harmony were Russell Downing, managing director of Radio City Music Hall, and Charles W. Halloran, first deputy industrial commissioner for the state of New York. Presentations on behalf of the District were made to them by New York City Mayor Robert F. Wagner.

Addressing the gathering, President Walsh stated that the first few meetings of the executive council of the merged AFL-CIO, of which he is a member, clearly demonstrated that the labor leaders of this country can function as a unit in peace and harmony. He was sharply critical of newspaper accounts which, he said, gave a distorted picture of the most recent session in Washington.

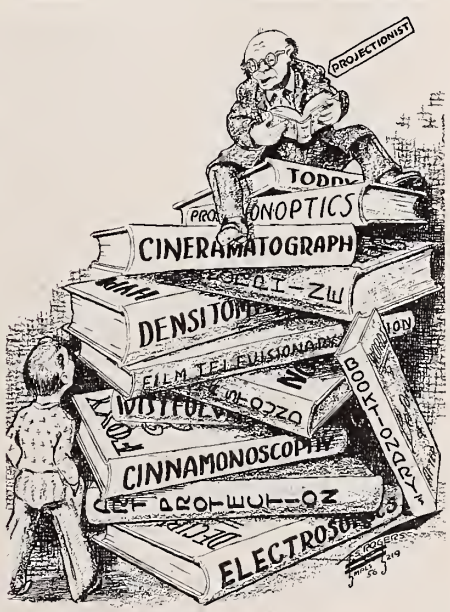


Leaders of New York District No. 10, IATSE, with the three guests of honor at the recent District biennial dinner. Left to right: Thomas Murtha (Brooklyn Local 4), chairman; Russell Downing, managing director of Radio City Music Hall; IA President Richard F. Walsh; Charles W. Halloran, New York State first deputy commissioner of industry; J. C. McDowell (New York Local 1), toastmaster, and H. Paul Shay (Elmira Local 289), District secretary-treasurer.

John C. McDowell, secretary of New York Local No. 1, was toastmaster at the dinner. Co-chairmen were Thomas Murtha, business representative for Brooklyn Local 4, and H. Paul Shay, of Elmira Local 289, secretary-treasurer of the District. Numerous officials of labor, industry, and government were introduced from the dais.

• The cartoon appearing on this page is the brainchild of F. S. Rogers, member of Minneapolis Local 219. Rogers states that the idea for the drawing was suggested to him by the various new and often confusing processes advocated during the past few years.

A member of the Minneapolis Local since 1914, Rogers designed and created the special background effects formerly used at the Minnesota Theatre there (now known as the Radio City Theatre). Since background effects are no longer used at the theatre, he has turned his talents to drawing cartoons, many of which have appeared in the labor weekly, "The Minneapolis Labor Review." Rogers also designed the cover and center page of the program for the IA 1952 convention, which was held in Minneapolis.



"Take up medicine, son."

IA ELECTION

LOCAL 165, HOLLYWOOD, CALIF.

Richard B. Frisbie, *pres.;* William J. Beecher, *vice-pres.;* Albert R. Pullen, *sec.-treas.;* William E. Higgins, *bus. rep.;* Jack Hansard, *sgt.-at-arms;* George J. Flaherty, Richard Hennley, Don V. Kloepfel, Harold Masser, Dwight L. Moore, Emmett L. Welch, Jr., Edward M. Werling, *board of directors;* William E. Hunger (chairman), James H. Brigham, Julius Gittleman, *trustees;* Lowell H. Keeley, Edward Mansfield, Joseph L. Shore, *exam. board;* G. J. Flaherty, R. B. Frisbie, Leo D. Guinan, W. E. Higgins, Leo S. Moore, *del. Central Labor Council;* G. J. Flaherty, W. E. Higgins, *del. State Feder. of Labor;* Flaherty, Frisbie, Higgins, Pullen, del. *IA Convention.*

Every Union Has Three Groups

1. Those who make things happen; 2. Those who watch things happen; and 3. Those who never know what happened.

Group 1. The officers and committeemen who do all the work of the union. The members who attend and take active part in the meetings of the Union. The members who work almost day and night, watching the business of the union and guarding the interest and welfare of the entire membership. They are the blood and guts of every union. They are about 5% of the membership.

Group 2. The loyal members who attend every meeting of their local union. They just attend, but do not take an active part in the business of the union. Their opinions are never heard and important decisions are made without help of their experience and thinking. The union loses valuable assistance because they do not speak. They are about 25% of the membership.

Group 3. These members never attend the union meetings. They pay their dues and think that is all they are supposed to do. They ask the man at the next machine "What happened at the meeting last night?" There are so many reasons for staying at home it is impossible to count them. A good program on TV, football, visitors at home, no clean shirts and a thousand others, very few valid. These members comprise about 70% of the membership.

Ask yourself this question — "In Which Group Do I Belong?"

The Labor News
(Worcester, Mass.)

Selection and Maintenance of Sound Equipment in Drive-In Theatres

A very important requirement for high-quality sound is ramp wiring of the necessary capacity.

By A. J. PLATT
Manager, RCA Theatre Equipment Sales

PROPER selection of projection and sound equipment for the drive-in theatre must be complemented by proper installation and operation for maximum efficiency. The use of quality material and the most expert techniques in wiring and installation is essential, particularly in ramp wiring which must run underground. Highest quality underground cable and conductors with adequate copper should be utilized to enable the amplifier system to operate at maximum efficiency.

Conductors below size Number 12 are not advisable for use in ramp wiring, particularly if the installation is extensive. It is important that the common or return conductor or conductors, as a minimum, should equal the feeders in circular mils of copper. This is especially important in a three-wire system where one of the conductors carries AC to the junction boxes for post illumination. Undersize common or return conductors may cause excessive 60-cycle hum in the in-car speakers.

Connecting Speaker Posts

To insure against possible short circuits in the ramp wiring, care should be exercised in looping the conductors between posts on the ramps. The bottom of the upright posts should be checked for possible sharp edges which might cut the insulation when the conductors are pulled through the posts.

In equipment operation, the gain should be used to provide a comfortable level of sound at the in-car speakers. This is preferable to operating with a high volume-control setting in the booth and a low volume-control setting at the in-car speakers, since it allows the amplifier system to retain its full power reserve for peak signals which otherwise might overload the amplifiers and cause distortion.

RCA has been designing, producing and marketing equipment for the nation's motion picture producers and exhibitors since the marriage of sound and film in the middle 1920's. Our line is sufficiently flexible to meet the budget, size and performance requirements of any given theatre, whether it be indoor or drive-in.

Specifically for the drive-in field, RCA markets a complete line of equipment which includes in-car speakers, heaters, junction boxes, lighting systems, automatic admission control systems, projection equipment, amplifiers and both magnetic and optical soundheads.

Reflecting the depth and variety of our line, RCA offers nine different sound systems which meet both the special needs of drive-in theatres and the particular needs of the individual theatre. Drive-in theatres vary considerably as to size and performance requirements. The nine RCA drive-in sound systems have been designed to meet any combination of budget, size and performance requirement of outdoor theatres of from 300 to 2500 car capacity.

The RCA PG-270/276G series, widely used throughout the industry, incorporates three single channel systems ranging in power output from 70 to 280 watts, for drive-ins with car capacities ranging from 280 to 1120; and two dual-channel equipments with power outputs of 140 and 280 watts, for car capacities of 560 and 1120. Each of these systems features a voltage equalizing network for automatic maintenance of constant polarizing voltage of photo-tubes; and 70 watt amplifiers with excellent frequency response and less than two per cent distortion.

Larger drive-ins require more elaborate sound systems. RCA provides four deluxe dual-channel systems for installations having car capacities ranging from 1200 to more than 2500. In addition, we offer a mixer system for magnetic reproduction in drive-in theatres. This system parallels four magnetic tracks for reproduction of the magnetic sound through existing single-channel optical amplifier and speaker equipment.

Closed-Circuit TV for Psychiatrists

In what is believed to be the first project of its kind a complete closed-circuit TV system has been installed in the Nebraska Psychiatric Institute in Omaha.



Small GPL television camera mounted on mobile cart peers through a glass window into children's therapy room at recently opened Nebraska Psychiatric Institute in Omaha.

Developed and produced by General Precision Laboratory, Pleasantville, N. Y., the system includes three highly mobile lightweight cameras, six monitors, projector, and the necessary controls and transmission lines.

The cameras are set up to cover three treatment rooms where the most interesting therapy is taking place. Each treatment room has a special camera port, through which the cameraman can shoot without disturbing doctor or patient. Next to each port is a power outlet and a connection to the transmission line leading to the control room. Sound is picked up by microphones permanently installed in the ceiling of each of the treatment rooms.

In the control room the three pictures are monitored and the most significant treatment is selected for transmission to the auditorium of the Institute. There it is heard and seen larger-than-life, projected onto a screen by a GPL PB-611 projector which employs a high efficiency Schmidt optical system. In this manner large groups of students are able to watch treatment being carried out and actually see and hear more clearly than if they were peering into the treatment room.

Projectionists Play Important Role In Altec Stereosound Promotion

IN MODERN times, public recognition nearly always demands that you be right there up front where you can be seen—on the screen, for example. The men behind the scenes—and screens—generally come in for very little public notice. We are happy to report that two men who make it possible for the public to see the widely acclaimed actors and starlets perform on the screen, have themselves come in for some public acclaim recently.

Projectionists Raymond W. Motley and Walton M. Mixon, members of Local 850, Sumter, S. C., were both key figures in a feature article on stereophonic sound that appeared in *The Sumter Daily Item*, a principal newspaper in that city. Both men appeared in a five-column picture taken inside the projection room of the Carolina Theatre in Sumter.

Reaching the Public

The feature was the first of its kind in a campaign recently launched by Bert Ennis, public relations head of the Altec Service Corp., to bring newspaper readers a better understanding of the new motion picture sound techniques, including the operations of the projection room as well as the important duties performed by the projectionists. The Carolina was the first theatre selected to demonstrate to the local citizenry via the local newspaper what goes on when they hear stereophonic sound.

The Carolina, 350 seats, is one of the smallest theatres in the state boasting a complete stereophonic sound system.

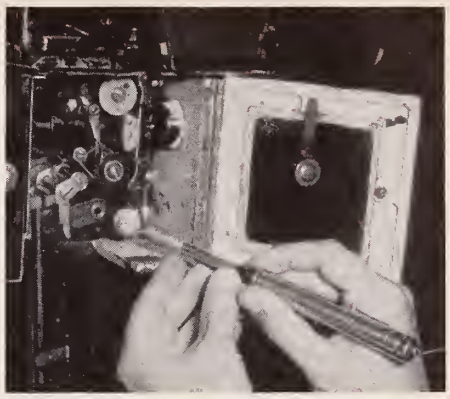


Purpose of the conference above is to help the average theatre patron better understand the new techniques, particularly stereophonic sound. Gathered in the projection room of the Carolina Theatre in Sumter, S. C. are (left to right): Walton M. Mixon and Raymond W. Motley, projectionists at the theatre and members of Sumter Local 850; Laurence Goldsmith, co-owner of the theatre; John Mitchell, feature writer for the *Sumter Daily Item*, and Bob Curry, field engineer for Altec. With the help of Curry and the projectionists, Mitchell wrote an article on stereosound for his paper.

Motley and Mixon are in charge of the 22 x 12-foot projection room that is completely equipped for both optical and stereophonic sound. Amplifiers are rack installed and swivel quickly in and out for inspection, adjustment and repair. Projection equipment includes a pair of Simplex XL machines with Strong Mogul lamp houses.

A novel use of the air conditioning system in this theatre during the summer affords necessary cooling to the generator. A special pipe construction permits sucking up of cool air in and around the generator from the floor of the projection room, following which it is carried off by a special exhaust.

For the article that appeared in the *Daily Item*, a feature writer and photographer were assigned to observe the performances of projectionists Mixon and Motley, along with Altec field engineer Robert Curry, attached to the company's southern division. The result was nearly a full page story together with photographs clearly informing readers of the workings of stereophonic sound. Similar features in other newspapers covering other theatres and projectionists in other localities are expected to follow.



Familiar dental mirror has been adapted by Bob Curry to the examination of hard-to-see corners of the projector mechanism. He combined the mirror with a small flashlight.

An interesting little tool, worth noting here, was found particularly impressive by the two Carolina projectionists. The device which was devised by engineer Bob Curry is for the purpose of making minute inspections of sprockets, guide rollers, and other hard-to-get-to places. Mounted in a fountain pen barrel is an extension to which is attached a small round mirror, such as the ones dentists use to examine teeth. Small batteries supply enough light by which to examine, among other things, sprocket teeth.

"Thrillarama" Joins List of New Screen Processes

A new film process, related to Cinerama and Cinemiracle—this one called Thrillarama, almost Texarama—arrived suddenly on the scene and premiered its initial production, "Thrillarama Adventure," earlier this month in Dallas, Texas. Responsible for the new development is Albert H. Reynolds, president of Thrillarama Productions, Inc. The Raphael G. Wolff Studios of Hollywood produced the first feature-length release, which was photographed in Eastman color "with a view to provide the movie-goer with thrills, adventure and beauty."

Thrillarama employs a dual set of cameras, a dual set of projectors, and a deeply curved 3½-to-1 ratio portable screen. The two French cameras with special optical systems are said to be capable of covering more than twice the area of other cameras. With the sound track on a separate reel, the two picture films are then mated together on the screen in the Cinerama fashion.

5,000-Foot Magazines

For projection, a pair of conventional projectors are locked together and operated simultaneously with crossed beams, each covering half of the screen surface. A special patented device is used to "dovetail" the two scenes in the center of the screen where they meet. Another device is attached to the base of the projectors for horizontal adjustments on the screen. Magazines containing 5,000 feet of film are used; changeover requires a short intermission.

The curved specular vinyl plastic screen, along with an erector type screen frame, is provided on a loan basis by Thrillarama to theatres wishing to exhibit the new "Thrillarama Adventure." In addition, all necessary projection attachments are also supplied on loan. Plans for distribution call for showings in any theatre anywhere, rather than "roadshow" presentations in large cities.

Magnetic Signal Test Film

A 400-cycle magnetic signal level test film, providing an absolute reference for the level of magnetically recorded signal, is now available from the Society of Motion Picture and Television Engineers. The film is designed for the 16-mm equipment and sound recording industry, as a basis for determining amplification, for frequency response calibration and for over-all system evaluation of 16-mm magnetic recorders and reproducers Priced at $20 for lengths of 100 ft., the test film is obtainable from the SMPTE, 55 West 42nd Street, New York 36.

Any Chance for a 3-D Revival?

HAVE any projectionists been wondering what, if anything, has developed so far as 3-D motion pictures are concerned during the past year? At least one reader, Herman Lewicki, member of Local 291, of Grand Rapids, Mich., is still interested in this potentially great but badly mishandled method of exhibiting films. In a recent letter to IP, Lewicki asked:

Have you any information on the present technical status of the Vectograph stereoscopic system? More than a year ago I read news items to the effect that the Polaroid and Technicolor companies were ready to start processing prints by this system. Could you tell me whether the silence since then has been due to some serious technical flaw in the Vectograph process or to lack of interest by producers because of the black eye 3-D received at the boxoffice.

In reply to this letter it can be said that so far as sheer visual realism is concerned, expertly handled 3-D can be far ahead of anything Hollywood is now offering. But 3-D received a very black eye at the box office because it was over-used, and because many producers were more interested in ballyhoo and a fast buck than in the harsh technical realities that must be overcome if the public is ever to give 3-D the support that it deserves. The Polaroid-Technicolor deal was cause for optimism months ago. But now even this faint gleam of hope appears to be dimming.

The Vectograph process involving two layers of polarizing material oriented at right angles to each other, has been used with success for "still" transparencies. The prints, which had to be viewed through Polaroid "analyzing spectacles" of the familiar type, were difficult to process and very expensive. The application of this process to motion-picture film involves several knotty problems, one of which, of course, is the matter of price.

Any type of print film which costs more than 6 cents a foot processed is considered expensive; any film costing more than 10 cents a foot is almost too expensive to be used for release-print purposes. At the present time it appears unlikely that Vestograph 35-mm film costing less than 10 cents per foot can be produced.

Technical Difficulties

In addition to this economic problem, there are several technical obstacles to be hurdled. Any motion-picture film must have a fairly uniform quality from foot to foot. The production of uniformly good Vectograph movie film is one of the problems engaging the attention of engineers working on the project. There is reason to believe that they will succeed in making a 1-strip 3-D film which is not too "spotty" for commercial use.

More signifIcant, perhaps, is the monochrome character of Vectograph transparencies. Most pictures today are in full natural color, and even the 2-strip 3-D movies we had a few years ago were in color. Stereoscopy, even more than CinemaScope, needs full color for added realism; but Vectograph is black-and-white and must remain so until diffraction polarizing materials are developed.

Such materials have been produced and studied by the Polaroid Corp., but they do not seem to hold much promise for Vectograph 3-D pictures in natural color. Another company has experimented with a third layer of photographically treated cellulose (similar to cellophane) to provide color to the 3-D images by diffraction, but has abandoned the project as impractical.

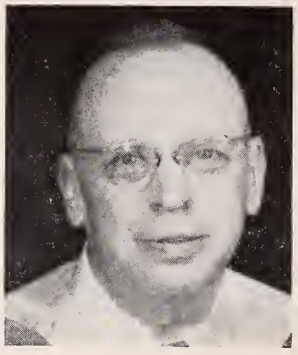
Objections to Process

While Vectograph has the advantage of 1-strip projection without filters over the projector lenses, and even though it provides a 3-D picture as bright as regular 2-D film, it has three outstanding faults in addition to the absence of color. (1) The pictures are not sharp enough; (2) polarization is imperfect, causing "ghosts" and annoying fringes, and (3) audiences are required to don Polaroid specs, as in the old 2-strip presentations —and patrons dislike wearing "analyzers."

The Technicolor Corp. is very hush-hush about its activities and sponsors no educational program in projection or allied fields. It may be assumed, therefore, that no technical information about the Vectograph 3-D process will be forthcoming from this organization until it is prepared to peddle its film to producers. But in view of Technicolor's dismissal last October of 425 employees (due, presumably, to an announced 30 per cent drop in color-print orders), it would seem that the Polaroid-Technicolor Vectograph project faces an unpromising future.

Harry H. Strong Is Dead; Founded Arc Lamp Firm

Harry H. Strong, president of The Strong Electric Corp., died early this month in Toledo, Ohio. Strong was renowned throughout the motion picture world as the inventor and developer of



The late Harry H. Strong

the automatically controlled arc lamp for theatre projection. He owned numerous patents covering his developments for arc lamps, slide projectors, and similar products. During World War II, Strong perfected an airplane spotlight which was extensively used by the U. S. Navy. The Strong Electric Corp., which bears his name, was formed in 1923, and in 1930 became affiliated with the General Precision Equipment Corp., of which it has been a subsidiary.

Strong was a charter member of TESMA, and a fellow of the SMPTE. Survivors include his widow, a son, and six grandchildren.

• • •

Karl Brenkert Dies at 63

Karl Brenkert, former head of the Brenkert Light Projection Co., maker of projection equipment, died recently at his home in Birmingham, Mich., following a heart attack. Brenkert was 63. He became president of the Brenkert division of RCA when his firm was purchased by RCA in 1945. He had been retired since 1950. Survivors are a son, Karl, Jr., and a daughter, Mrs. Paul M. Tiefel.

New Animation Process

A new animation process, called "cine-graphic," was introduced on television recently and may eventually be used for theatrical projection. The revolutionary aspect of the new technique is that it does away with the usual stop-frame animation procedure. In addition, it is claimed that the new method is five times cheaper than the stop-frame method.

Basically, cine-graphic achieves its effect by way of "live action camera movement" over graphic material, which is to say that the camera is maneuvered to take shots of drawings so as to give the effect of continuous animation, without the drawings themselves containing the sequence of movement picked up by the camera. With a carefully planned series of camera pans, quick cuts, multiple exposures and other techniques, the screen always shows action.

On the recent CBS Tv program, "Adventure," the story of a hawk was portrayed. The camera actually "flew" instead of the hawk, though it seemed that the bird itself was going through the movements.

SCIENCE NOTES

PHOTOS ON ALUMINUM now are possible with a pre-sensitized aluminum "film" developed by the Metalphoto Corp., Cleveland. The aluminum sheets are exposed and processed in the same manner as ordinary photo paper, and can be immersed in various dye solutions.

* * *

A "NOISE INDEX" for instrument cables subjected to shock, vibration, or transient pressures has been developed for the National Bureau of Standards. The "index" provides readily interpreted data for reducing cable noise produced by spurious voltages in hearing aids, phonograph pickups, or crystal-type microphones.

* * *

TINY SILICON RECTIFIERS may reduce electric power costs on a large scale. A small device that converts a.c. into d.c., the rectifier is capable of operating continuously at temperatures up to 400 degrees F., according to Bell Telephone Laboratories.

* * *

INSULATING "WOOL" made from Mt. Etna lava has been developed under a German patent to withstand greater heat than most glass fibers. Now used for refrigerator insulation and acoustical purposes in theatres, the U. S. government is studying it for possible jet plane application.

* * *

ATOMIC GENERATING CAPACITY will be doubled every four years between 1960 and 1980, according to General Electric Co. In 25 years, it is predicted that 23% of all power plants will be atomic.

* * *

JUDGING SURFACE ROUGHNESS of mass-produced parts may be speeded up as the result of a new approach developed by the Bausch & Lomb Optical Co. Rochester, N. Y. A pocket-size, hand-held instrument called a "surface comparator" operates on a unique optical principle which greatly emphasizes surface irregularities. The new principle permits metal surfaces to be compared with a selected standard for roughness under 10-power magnification.

* * *

A "FLUOMERIC" LAMP which is said to combine the best features of incandescent. fluorescent. and mercury vapor tubes has been developed by Duro-Test Corp., North Bergen, N. J. Yielding 25 lumens per watt, this screw-in bulb can burn for 12,000 hours. Color may be varied by changing the phosphor composition.

* * *

ELECTRIC POWER use in the U.S. will double in the next 10 years reaching a trillion kilowatt-hours by 1966, according to Sylvania Electric Products, Inc.



1st Choice
for the PRIME LENS
SUPER SNAPLITE

8 out of 10 Exhibitors today choose a Kollmorgen Super Snaplite for their prime lens. Perhaps this is because for more than thirty years Snaplites have been the standard by which all other lenses have been judged.

For speed, for contrast, for definition and for terrific brilliance on the screen, your 1st Choice is a Super Snaplite.

Write for Bulletin 222.

KOLLMORGEN Optical CORPORATION
Plant: Northampton, Massachusetts
New York Office: 30 Church Street, New York 7, N. Y.

An expert makes some suggestions for obtaining a brighter and sharper image on outdoor screens.

More Efficient Drive-In Projection

By F. W. KEILHACK
Drive-In Theatre Mfg. Co.

DRIVE-IN THEATRES have increased in less than a decade from 300 theatres in 1946 to about 5000 as of August 1955. This short period has seen our drive-ins graduate from the "pasture cinema" stage to become the "aristocrat" of neighborhood movie presentation methods.

During this rapid period of growth, however, too many drive-in owners have failed to keep pace with sorely needed equipment changes and modernization programs. This complacency has now placed them in the position of "progress and live, or stand still and die." Today's drive-in theatre must have the ultimate in sound, light and projection. The show-going public will not accept less.

Regardless of the talk that drive-ins may have reached the saturation point, most experts feel that this type of theatre has not seen its full development yet. With so much of the world on wheels and with confidence in the future, our every thought should be on *how to better please prospective customers.*

Wide-screen processes have greatly increased drive-in light problems. These problems were solved fairly quickly in the indoor theatre, but with outdoor screens assuming gigantic proportions, manufacturers and projectionists alike have been constantly fighting for more screen brightness and better projection. A vicious chain reaction resulted. More light means higher amperage; higher amperage means more heat; heat means mechanism troubles and resultant projection problems. Constant research has now produced mechanisms and attachments to remove this excessive heat.

Recent surveys have indicated that many theatres with modern equipment were still experiencing screen-brightness problems. The following sources of trouble have been found to be most common, and correction has increased the much needed light on the screen:

Improper alignment of lamp and projector.

Improper carbons.

Wrong amperage and voltage.

Improper use of porthole glass.

Improper matching of reflector and projection lens speeds.

Careless reduction of shutter blades.

Screen surface and paint not of proper reflectance.

Light distribution is affected by whether a screen is flat or curved, tilted or vertical.

Another serious detractor of screen brightness in the drive-in is reflected light. The "bad boy" is the moonlight tower. The colors employed for moonlighting can upset a picture no end. It would pay to thoroughly check the screen before the show starts for all these reflections. You may be surprised to find your screen well lighted even before a picture is projected on it. Why fight this losing battle? Until your screen is free enough of stray light to pass practically unnoticed before projection starts, your struggle will continue.

The last culprit is screen density. Why install heavy equipment to produce light, only to have it impeded by this demagog from Hollywood?

Several years ago our company introduced a lamphouse blower to be used as an auxiliary to the exhaust system. Today, with higher amperages, engineers acknowledge that a lamphouse blower is necessary to immediately relieve the lamp of the excessive heat, gasses and dirt, letting the main exhaust system take it after the gas is in the main pipe.

With only a 4-inch or 5-inch speaker unit in the in-car speakers, sound is far below the quality we expect at the indoor theatre or in our better radio and Tv sets. It is extremely important, therefore, that only the finest units obtainable be installed for replacements, and in the case of a new theatre, a careful selection be made to insure the finest sound quality obtainable.

Collectively, we manufacturers and projectionists must show the theatre owners the most efficient and economical way to meet today's high standards.



Expensive Economy

To the editor of IP:

Have you heard about the additional belt-tightening that may soon take place in our already hungry theatrical system? The latest penny-wise economy to be suggested by the front offices is a further cut in equipment servicing. Reliable sources report that some of the tycoons have decided two service calls per year is all our equipment requires, and that this curtailment will save vast sums. As of now, we know of no circuit where the twice-a-year deal has gone into effect, but it is being considered.

The saving? No sound service organization contacted would actually quote a rate for so hopelessly inadequate a degree of maintenance, but on the basis of some unofficial estimates, and breaking these down into savings per seat per show for small to medium-sized suburban houses with no weekday matinees, it works out to one-thirtieth (1/30th, that's right) of a cent! That's the saving from dropping the service frequency from once a month to twice a year.

It's well that IP circulates strictly within the craft; nobody outside would believe, let alone comprehend, this particular and exclusive characteristic of the motion picture industry of constantly striving to destroy the product it has for sale. Where else would one find behavior comparable to that of the exhibs who spent a shipload of folding green on a legal battle to establish their right to compress the four channels of stereophonic sound into one? And what other industry, except for transportation systems operating under monopolistic franchises, would do anything comparable to the leading theatre of a national circuit in a three-quarter million community which knowingly ran a multi-million dollar musical CinemaScope picture for five weeks with one screen channel virtually dead?

If TV continues to bend so diligently to its oars and exhibition continues so frantically to back water, who can say how long the technicians and engineers will continue their efforts in its behalf.

CHAUNCEY L. GREENE
Minneapolis, Minn.

Theatre with "Rubber" Lenses

To the Editor if IP:

May I come in for my two cents worth? Have enjoyed reading the comments on wide screen problems and especially those on "Marty" in the February issue of IP.

Our set-up here in the Times Theatre in

Seaside, Oregon, may be of interest to some of your readers. In the first place, all screening is done between fixed top and bottom maskings. This is accomplished by using an expanding type or "rubber" lens. We screen a non-anamorphic picture in the aspect ratio in which it was photographed—any ratio up to and including 2 to 1. Incidentally, VistaVision is screened at 2 to 1 very effectively.

In changing aspect ratios the projectionist simply selects the aperture plate and runs the lens out to the corresponding mark. That's all. The picture fits the screen without further adjustments. CinemaScope occupies the same height on the screen as the flat pictures, and this also is accomplished without tilting or twisting the projectors.

In running "Marty," we used a 1.66 to 1 aperture plate which resulted in very satisfactory screening.

FRANK DUNDON

Local 446, Astoria, Ore.

COMMENT: Neat trick if you can get away with it, but experts say that a variable focus or "rubber" lens does not compare in definition with a fixed-focus lens, and suggest that use of variable-focus type lenses should be restricted to special projection effects or emergencies.

"Tuning In" the Projector

To the Editor if IP:

During a recent showing of the picture, "Man With the Gun," a scratched portion of the print shown on our screen appeared much like the common television "vertical line" interference. A patron complained hotly to the managed and insisted that he "get in touch with those operators and tell them to tune the picture in a little better to get rid of those annoying vertical lines!" A little too Tv-conscious, we think!!

PROJECTIONISTS CREW

Parkhill Theatre
Yonkers, N. Y.

Growing Electronics Field

According to Frank M. Folsom, president of RCA. the nation's electronics industry will reach a yearly volume of $18,000,000,000 by 1964, representing a 66% increase over the present annual $11,000,000,000. The predicted increase is double that of the anticipated gain of the nation's economy as a whole. Folsom also claimed that color TV will spark the electronics industry's growth.

Newsreels Disappearing

Newsreel shorts are disappearing from many theatres throughout the country because exhibitors feel that the newsreel cannot compete with TV. By the time they reach the theatre, they have already been widely shown in homes and have lost their news value, it is asserted. Customer surveys have established, however, that the public still enjoys theatre newsreels.



WHEN YOU BUY...

Buy Simplex

T.M. REG. U. S. PAT. OFF.

Your SIMPLEX Projector Mechanism represents a priceless investment. You bought it after long, careful study because you recognized it as the finest projector on the market.

Don't take chances with such an investment — *the very success of your theatre* depends upon its performance! When spare parts are necessary, insist on the best — insist on *SIMPLEX* parts!

From the smallest stud pin to the largest gear cover, every part is made with the same precision and skill as the mechanism itself. By using *only* SIMPLEX parts, you can be certain of maintaining the high quality of performance that has made SIMPLEX the world's foremost projector mechanism!

Genuine SIMPLEX parts are available only through

N.T.S

Your Guarantee

of Consistent Quality and Outstanding Service

NATIONAL THEATRE SUPPLY • 29 BRANCHES COAST-TO-COAST

PROTECT YOUR PROFITS

with this

PERFECT-PICTURE PRIME LENS

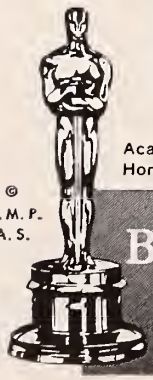


Bausch & Lomb SUPER CINEPHOR Projection Lenses

Today's great new movies and exciting film techniques are pulling audiences out of the home and into your theatre. Your profits depend on keeping them eager to come back for more. Make *sure* . . . with the *only* prime lens that transmits *all* the brilliance, color and vivid detail to your screen. Prime up *right* with B&L Super Cinephor Lenses, for today's most faithful screen rendition of all 35mm releases.

SEE THE BIG DIFFERENCE . . . FREE DEMONSTRATION

Write, wire or phone for Catalog E-123 and for free demonstration. (Indicate dealer preference, if any.) Bausch & Lomb Optical Co., 61605 St. Paul Street, Rochester 2, N. Y. Phone: LOcust 3000. (In Canada, General Theatre Supply Co., Ltd., Toronto.)



Academy of Motion Picture Arts and Sciences
Honorary Award for Optical Service to the Industry

© A. M. P. A. S.

BAUSCH & LOMB

SINCE B&L 1853

BOOK REVIEWS

THE CINEMATOGRAPH REGULATIONS, 1955, by Leslie Knopp. The Cinema Press Ltd., London, England, 185 *pages*.

This handy detailed volume contains the latest government regulations pertaining to motion picture theatres in Britain as well as governmental recommendations to local authorities designed to establish uniformity, plus the author's expert analysis and interpretation of each regulation. It is a very timely publication for British projectionists and theatre managers, as the Cinematograph Act of 1952, governing England, Wales and Scotland, went into effect January 1, 1956.

Fundamentally, the book strives for increased public safety. Dr. Knopp believes this can be brought about through greater understanding of and adherence to the revised cinema regulations. That British authorities have given much thought to these regulations and recommendations is evidenced by the separate treatment of nitrate and acetate film use.

Cinema officials in Britain are aware "that the risk of a slow-burning film being set on fire either in the projector or otherwise is practically negligible." Quite sensibly then, they have prescribed more lenient regulations covering theatres where only safety film is used as compared to the stringent precautions outlined for nitrate film users. It is apparent by the tone of all the regulations as well as the author's analyses that the Britains take their theatres and projectionists quite seriously.

MANUAL OF AUDIO VISUAL TECHNIQUES, by Robert de Kieffer and Lee W. Cochran, Prentice-Hall, Inc., 220 *pages*, $3.60.

Here is a combination text and laboratory manual, designed to give a short, comprehensive overview of all phases of audio-visual techniques and to provide opportunities for students to utilize this knowledge in the form of problems and projects.

Each chapter includes a concise survey of a particular aspect of the growing audio-visual field. Projectionists will find especially interesting the chapters on Principles of Projection, Filmstrips and Filmstrip Projectors, Motion Pictures and Motion Picture Projectors, and Principles of Sound. In addition to selected bibliographies at the end of each of the 29 chapters, the manual contains many informative drawings and photographs illustrating audio-visual techniques.

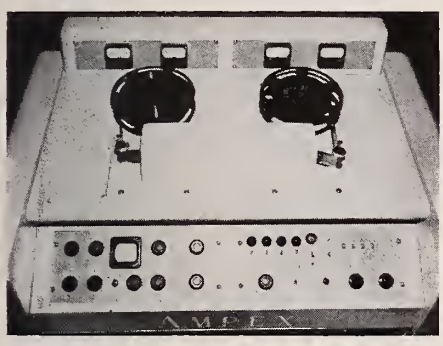
77 Years Ago

The first street arc lamps, made by Charles F. Brush, were lighted in Cleveland, Ohio, on April 29, 1879.

Ampex Records TV Picture on Magnetic Tape

Ampex Corp. recently announced a new process for the recording and reproduction of TV programs—both sound and picture—on magnetic tape. In so doing Ampex joined RCA as a leader in this important new field. Following simultaneous demonstrations in Chicago, Ill. and Redwood City. Calif., Ampex sold six of its prototype units (see photo), three each to CBS and NBC, at $75,000 per unit. Actual delivery of the equipment is scheduled for late summer.

The new Ampex VTR (video tape recorder) system records both picture and sound on a single magnetic tape two inches wide. The quality of the picture that results when the video signal is reproduced from a tape record is said to be better than the results now obtained with kinescope techniques in TV studios. A kinescope is a motion picture film record of a TV program that is made by photographing the image on a TV screen. Resolution, or the measure of clarity possible when a picture is reproduced from tape, is said to be at least as great as the capability of the average TV receiver.



Top view of Ampex Corp.'s new magnetic tape recorder for TV programs. The unit will record both pictures and sound for a full hour's program on a reel of magnetic tape two inches wide and 14 inches in diameter.

Programs can be recorded directly from both the TV camera and receiver, as well as from transmission lines and microwave relay systems. No processing of any kind is necessary, enabling immediate playback. This advantage can be instrumental in overcoming the East-West time differential problem encountered by many stations. Considerable economy can be achieved by "erasing" the recorded signals when they are no longer needed and then re-using the same tape to record other programs.

Following installation and adjustment of the equipment, operation is as simple as pushing buttons: one to start recording, another for playback. The recording process functions as follows: electrical signals are passed through a coil around an electro-magnet known as the recording head. The strength of the magnetic field in the recording head at any time depends on the electrical current in the coil at a given instant. In turn, the magnetic field impresses a pattern on the magnetic surface of the tape as it passes the recording head. The pattern on the tape, therefore, corresponds to the electrical signals in the coil on the recording head. Since the electrical signals are generated by the TV camera (or other source), the pattern on the tape corresponds to what the camera "sees" at any given instant.

Reproducing the Picture

For playback, the tape is passed across the same magnetic head. The magnetic pattern on the tape induces a current in the coil around the head. Since the pattern corresponds to the original picture, the induced current can then be fed directly to a television transmitter which transfers the signals to the receiver for reproduction on the face of the tube.

Tape speed of the Ampex VTR is 15 inches per second, permitting more than

Are You Moving?

If so, please notify us one month in advance. The Post Office does not forward magazines. To avoid delay, please cooperate by sending us both your *new* and your *old* address.

Your concessions may delight gourmets...



Your lounge may be the smartest...



BUT EVERY PERFORMANCE STILL MUST BE PERFECT!

First matinee or midnight show, perfect performances demand equipment that runs like a top. There's no expert like an expert RCA Theatre Service Engineer to keep everything humming. He's the *only* man with full backing of RCA's long-famed technical resources.

RCA SERVICE COMPANY, INC.
A Radio Corporation of America Subsidiary Camden, N.J.

Clayton Ball-Bearing Even Tension Take-Ups
For all Projectors and Sound Equipments
ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS.
SILENT CHAIN DRIVE
THE CLAYTON REWINDER
FOR PERFECT REWINDING ON 2000-FOOT REELS.
CLAYTON PRODUCTS CO.
31-45 Tibbett Avenue New York 63, N. Y.

an hour's program to be recorded on a single 14-inch reel. To achieve this relatively low tape speed, a rapidly rotating head assembly is used. Thus, while the tape itself moves slowly, the head assembly moves across its surface at a contrasting high speed. The head assembly actually consists of four heads placed on a rotating drum. One head is always in contact with the surface of the tape. As one head leaves the tape, the next makes contact. The magnetic pattern is established transversely across the tape instead of longitudinally as in conventional audio recorders.

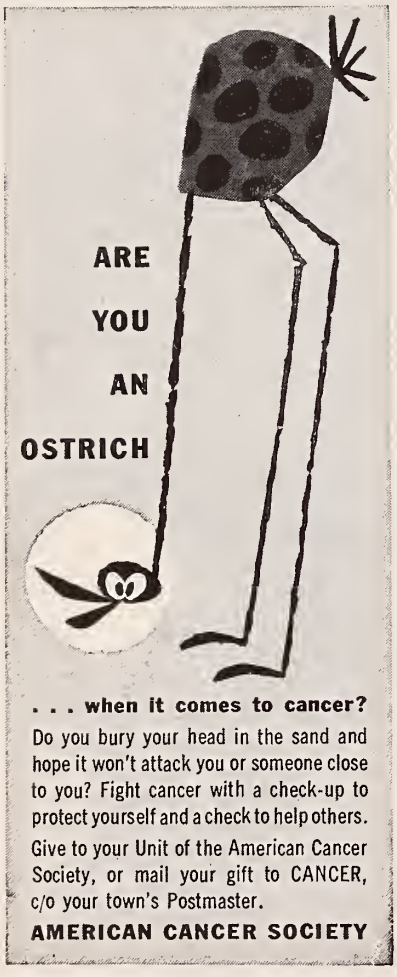
The sound accompanying the picture is recorded in the usual manner along one edge of the magnetic tape.

PAR's Rear-Projection C'Scope

Referring to an article in the December issue of IP ("Rear-Projection CinemaScope Aboard Ocean Liners"), PAR Products Corp., Holiywood, informs us that the La Cosa Theatre in St. Ann, Mo., has been using rear-projection CinemaScope successfully since 1952.

The La Cosa setup was made possible through a combination of PAR's rear-projection "C" Vertar lenses and Pantar anamorphic expanders. To meet the theatre's requirements for a picture size of 21′ 8″ by 10′ 2″ at a throw of 40 feet, 2¾″ E. F. *f*:1.8 PAR "C" Vertars were employed. For rear-projection of standard release prints, these lenses are used in conjunction with 1½″ *f*:2.0 Vertars, projecting a picture 21′ 8″ wide and 12′ high at 40 feet.

The La Cosa Theatre was specifically designed for rear-projection, using the 1½″ PAR Vertar lenses. The PAR Corp. also announced that both the Bausch & Lomb and Hilux anamorphic expanders may be used with the PAR "C" Vertars, which are available also in 16-mm.



. . . when it comes to cancer?

Do you bury your head in the sand and hope it won't attack you or someone close to you? Fight cancer with a check-up to protect yourself and a check to help others.

Give to your Unit of the American Cancer Society, or mail your gift to CANCER, c/o your town's Postmaster.

AMERICAN CANCER SOCIETY

Is Color Always Advisable?

Humphrey's laboratories in Britain have been experimenting with a new tint system for motion pictures that tones down actual color values by injecting elements of black and white. Ronald Neame, British producer-director, said the process is most effective in doing semi-documentary films. Neame recently completed "The Man Who Never Was," a semi-documentary in CinemaScope and full color. He noted strongly his objection to 20th-Fox's policy of producing *all* CinemaScope pictures in color, pointing to the dramatic qualities of black and white and insisting that "black and white will always have a place on the screen."

Kodak Registers 1955 Gains

Sales and earnings during 1955 were the largest in Eastman Kodak's history. Consolidated sales of the company's U. S. establishments rose last year to $714,443,836, or about 13% over best previous yearly sales figures. Net earnings after taxes in 1955 were $85,600,330, an increase of 22.6% over the former high of $69,821,719 in 1954. Sales and earnings in the fourth quarter of 1955 also set new marks.

Additions and improvements to company holdings last year cost to $45.5 million. To carry on the expansion program during 1956, the board of directors have approved a record budget of approximately $57 million.

Sales of film for professional motion picture use and television continued to grow, it was reported. Exports and sales overseas also showed substantial increases during 1955.

Bodde 16-mm Screen and Frame

The Bodde Screen Co. and the Tru-Roll Corp. have combined forces to put out a screen and frame specifically designed for wide-screen or 'Scope 16-mm motion picture projection. Like other Bodde screens this one is without seams. The surface is impregnated throughout the thickness of the single piece of material to prevent flaking off of the reflective agent.

The Tru-Roll 16-mm frame is made of 2″ by 2″ tubular steel and comes in four standard sizes: 8′6″ x 19′, 7′6″ x 18′, 6′6″ x 17′, and 9′ x 12′. Shape of the frame may be either straight or curved as desired. Special lacing hooks are provided for taut and smooth lacing of the screen. For portability, the frame can be dismantled or assembled in 15 or 20 minutes. Tru-Roll also puts out an aluminum collapsible frame. Tru-Roll Corp. is located at 516 Commercial St., Glendale 3, Calif.

SPLICES NOT HOLDING ?

Film breaks are costly. Play safe by using

JEFRONA

All-purpose CEMENT

Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.

CAMERA EQUIPMENT CO.
DEPT. J-5-8
315 West 43rd Street New York 36, N. Y.

Lorraine ORLUX SUPER-CHARGED LARGE-CORED Carbons

For DRIVE-INS & THEATRES with HUGE, WIDE-AREA SCREENS • CARBONS, Inc. BOONTON, N.J.



Super-Hilux®

THE PROJECTION LENS with GREATEST OVER-ALL INCREASE IN LIGHT TRANSMISSION

F:1.0 LIGHT COLLECTING SPEED

1 *year* in service . . . proven in hundreds of theaters!

1st to present an entirely new concept of theater projection!

1st to be designed with emphasis on acutance!

1st to be chosen by leading DRIVE-INS and THEATERS.

Four reasons why a Super-Hilux should be *1st* on your list of "Musts." Write for comparison tests and focal length computer to Dept. P-56

PROJECTION OPTICS

PROJECTION OPTICS CO., INC.
330 Lyell Ave., Rochester 6, N. Y.

OBITUARIES

SAPPINGTON, ERNEST LEE, 74, member of St. Louis Local 143, died recently from a heart attack he suffered several months ago. He was highly regarded in projection circles and was considered a topflight craftsman. Prior to his illness he worked in the projection room of the Rivoli Theatre in St. Louis.

• • •

VANE, BERNARD, 59, member of Albany Local 124, died March 24. For the past 28 years he worked as projectionist at the Leland Theatre in Albany. His wife, three sons, and two daughters survive.

• • •

FLOOD, HARVEY N., 58, member of Local 433, Davenport (Iowa), Rock Island and Moline, Ill., succumbed to a heart attack on March 13. He was a projectionist at the Sunset Theatre in Davenport. In 1919 Flood became a member of Davenport Local 515, until its merger with Local 433 in 1924. He was a member of the Eagles, the Turners, the Masonic Lodge, Davenport Consistory, and the Kaaba Shrine of Davenport.

• • •

MULLER, CHARLES, 64, chief projectionist at Radio City Music Hall in New York for many years and member of Local 306, died last month. Ill health forced his retirement about a year ago, and his death saddened his many friends throughout the country. A visit to the projection rooms at the Music Hall was a "must" for many out-of-town IA men, and Muller's unfailing courtesy and consideration won him a host of friends. He is survived by his wife, two sons, and a daughter.

• • •

GRIFFIN, WILLARD A., 57, member of Local 144, Memphis, Tenn., died recently at the Memphis Eye, Ear, Nose and Throat Hospital. He entered the hospital several days before his death. He held the post of secretary-treasurer of the Memphis Local until failing health forced him to resign from all activities about 18 months ago. Griffin served with the U. S. Navy during World War I. and was stationed in the Middle East. He was a member of the Pine Bluff (Arkansas) Masonic Lodge. Survivors are his wife, two daughters, two brothers, and three sisters.

• • •

BAILEY, JOHN W., 73, member of Cleveland Local 160, was stricken with a heart attack in the projection room of the Mall Theatre there. He was a member of the Cleveland Local for 45 years. He is survived by his wife, Lydia.

• • •

BURFORD, HARRY, business representative for Local 730, Barstow, Calif., died last month after being hit by an automobile, while parking his car. He failed to regain consciousness and died shortly thereafter.

• • •

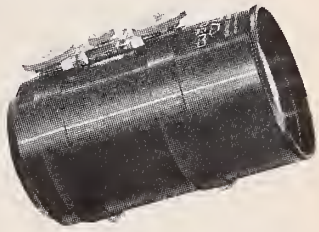
JONES, WILLIAM L., 55, member of Local 265, Greensburg, Penna., and for the past 14 years sound engineer for RCA, died recently while on a business trip to Flint, Mich. His wife and two daughters survive.

HILUX®

WORLD'S FINEST ANAMORPHIC PROJECTION LENSES!

Comparison tests in famous theaters throughout the world have proven Hilux Anamorphic Projection Lenses vastly superior. Precision designed and built, they have optimum optical correction for color, definition and distortion. You owe it to your audiences to use Hilux Anamorphics for *ALL* prints.

HILUX VAL



An amazingly precise *variable* anamorphic that gives non-vignetting performance with *both* 4" (101.6mm) and $2\frac{25}{32}$" (70.6mm) diameter prime lenses. Complete control up to 2X without shifting lens or projector.

HILUX 264



A high quality 2X *fixed* anamorphic for all projection lenses up to $2\frac{25}{32}$" (70.6mm) with a 64mm free rear aperture for maximum non-vignetting light transmission.

HILUX 152



A 1.5X to 2.0X *variable* anamorphic for all standard $2\frac{25}{32}$" (70.6mm) projection lenses. 64mm free rear aperture assures maximum light with no vignetting.

Hilux 264 and 152 are available with either fixed or variable corrector lenses. For catalog sheets and focal length computer, write Dept. P-56.

PROJECTION OPTICS

PROJECTION OPTICS CO., INC.
Rochester, N. Y. • London, England

Westrex Economy Sound

Westrex Corp. has announced a new line of sound equipment, known as the Economy System, which is said to provide smaller theatres with the best quality units at unusually low prices. This single channel sound system is reportedly less costly than comparable '55 equipment, as well as being easier and quicker to install and maintain than previous systems.

The units comprising the Economy System are as follows: the R11 photographic reproducer, with silent chain drives and turret-mounted dual exciter lamps; the 45A single channel transmission cabinet, for wall or table; the 26 type 30 watt power amplifier, featuring new circuits and specially wound coils for less distortion and less current with standard vacuum tubes; the 14 type loudspeaker assembly, containing Westrex's improved high and low frequency components.

Red Projection Licenses

A licensing system for persons owning motion picture projectors has been instituted by the East German government. Licenses will only be issued to applicants who prove they are "promoting socialism. German reunification and national defense." Failure to comply with this policy will mean confiscation of the projector.

BRUSHUP ON FUNDAMENTALS

(*Continued from page* 16)

thereby creating a fire hazard. For this reason all motion picture projection equipment is grounded. The charges will then leak off to ground before a spark can be created near the film.

What are charged and neutral bodies?

All types of matter would like to remain in a neutral or uncharged state. We know that if we should touch a piece of wood, paper, or steel, we would not experience an electrical shock provided that these substances were not acted upon by friction or electricity. We consider these substances to be electrically neutral, and their average charge is zero. They still have atoms and their atoms contain positive and negative charges, but because these atoms are in a state of equilibrium, the positive charges are equal in strength to the negative charges. The positive charges will cancel out the negative charges and tne net charge of the substance will be zero.

Suppose that we could remove one or more electrons from a neutral atom. The atom then would have a deficiency of electrons and it would be left with a positive charge. On the other hand, if we could take one or more electrons from one atom and give it to another, the atom which received the electrons would then be negatively charged because it had an excess of electrons. Notice that we do not speak of positive charges as moving from atom to atom, only electrons are free to move.

Electrons may be transferred from one atom to another by the application of heat, light, chemical action, friction, electrical pressure, and mechanical vibration. Run a comb through your hair, then hold the comb near a tiny piece of paper. The paper will be attracted to the comb. This attraction is due to the fact that opposite charges appear on the two objects.

[TO BE CONTINUED]

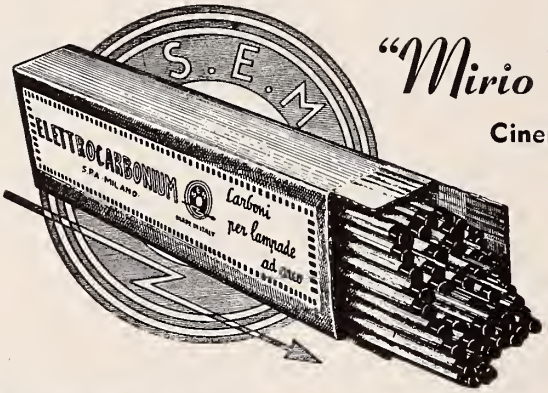
PROJ. ADVANCES ON WAY

(*Continued from page* 12)

well advaneed. However, we are faced with the serious questions as to the actuality of a market and quantities to be anticipated for such equipment.

In addition to print costs, there is the further complication of lack of standardization of film width on the part of the studios. Equipment can be provided to handle either at the expense of added cost and complexities of operation. Projectors can be produced as combination wide film and 35-mm or as wide film only. Considerable study has been given to the advantages of each approach.

As screen widths have increased and reasonable screen brightness retains, noticeable increase in flicker is encountered. To bring this within tolerable limits, it is desirable to increase the flicker rate to approach a frequency to which the eye is insensitive. A three-blade shutter effectively accomplishes this, but at the expense of intolerable loss of light. Through speed-up of the intermittent movement a portion of this light can be



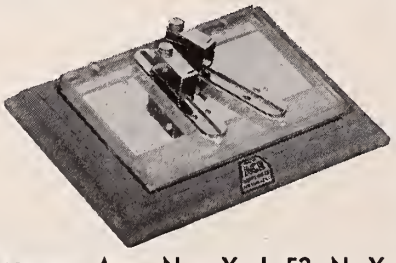
"Mirio"
Cinema Carbons

ELETTROCARBONIUM
VIA BORGHETTO. 5 — MILANO (Italy)

Splicing Problems Are Coming!

If you're thinking of ordering a new splicer, be smart and investigate the Ace Clear Vision Film Splicer, a completely new method. From 8-mm to 70-mm.

- It makes a strong splice on acetate.
- Will splice the new DuPont Cronar base and join Cronar to acetate.
- It is non-magnetic — Will not injure CinemaScope soundtracks.



See your motion picture supply dealer or write direct to

ACE ELECTRIC MFG. CO., 1458 Shakespeare Ave., New York 52, N. Y.

Vallen for
CURTAIN CONTROLS, TRACKS and SPECIAL OPERATING DEVICES
VALLEN, Inc.
AKRON 4, OHIO

regained. Much consideration is being given, therefore, to the practicability of a faster intermittent which will permit widespread adoption of the three-blade shutter where flicker is a problem. Perhaps, as equally important, the faster movement will be instrumental in providing additional light in drive-ins where inadequate illumination, rather than flicker, is the problem. Obviously to be practical, the faster intermittent must be a simple field substitution and will not require purchase of new projectors.

Improving Focus

Again, wide screens achieved through added magnification and the requirement for added illumination have emphasized the need for improved focus to maintain screen quality. Development work initiated many years ago, and brought up to date, as a result of current focus deficiencies, has shown that excellent improvement in overall screen quality can be realized by means of a properly designed curved gate. Availability of this device as a field modification will represent worthwhile advance.

In the meantime, improvements in light sources continue. One of the more important developments in this field includes a mirror incorporating heat filtering characteristics of high efficiency.

In the category of screens and accessories, curved and flat, I was privileged to view an interesting development recently pertaining to a variable curvative screen frame. By means of motor drive this frame is capable of continuous variation from flat to extremely deep curvature. This item should be of considerable importance in determining the most desirable curvature for a given house. It is equally as important in houses desiring a curved screen where it is also necessary to fly the screen.

These and similar developments are consistent with activities which have always characterized equipment activities in motion pictures. There is nothing in these programs which signal major obsolescence of projection equipment. They should in no important way influence a delay in programs of improvement now contemplated.

FILM BASE MATERIALS

(*Continued from page* 11)

tracts when processed and dried.

The mechanical characteristics of film are practically identical with those of the base material alone, since the base is appreciably thicker than the emulsion. Black-and-white emulsion (including the underlying thin binding layer of clear gelatine) is only 0.0005 of an inch thick, while multilayer color emulsion has a total thickness of 0.0010 inch. Nitrate base is 0.0050 inch thick, and triacetate base is 0.0055 of an inch in thickness.

The total thickness of the various types of nitrate and triacetate films, accordingly, are:

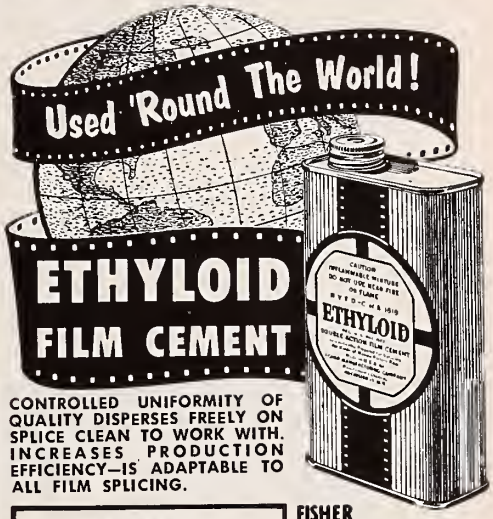
Nitrate black-and-white,	0.0055″
Nitrate Technicolor,	0.0055″
Nitrate duplitized color,	0.0060″
Triacetate black-and-white,	0.0060″
Triacetate Technicolor,	0.0060″
Triacetate multilayer color,	0.0065″

Certain manufacturers make the new polyester film base with a thickness of only 0.0040 inch, hence:

Polyester black-and-white,	0.0045″
Polyester multilayer color,	0.0050″

Even multilayer color film made of polyester base material is a trifle thinner than standard nitrate black-and-white film, and, of course, appreciably thinner than triacetate multilayer color film. Specifically, a reel which holds exactly 2,000 feet of nitrate black-and-white film will hold 1,833 feet of triacetate black-and-white film, 1,692 feet of triacetate multilayer color film, 2,444 feet of polyester black-and-white film, or 2,200 feet of polyester multilayer color film.

The thinness of polyester film allows a longer running time per reel from 17% to 18% longer than nitrate, and from 23% to 25% longer than triacetate, depending on whether the emulsion is 0.0005″ monochrome or 0.0010″



CONTROLLED UNIFORMITY OF QUALITY DISPERSES FREELY ON SPLICE CLEAN TO WORK WITH. INCREASES PRODUCTION EFFICIENCY—IS ADAPTABLE TO ALL FILM SPLICING.

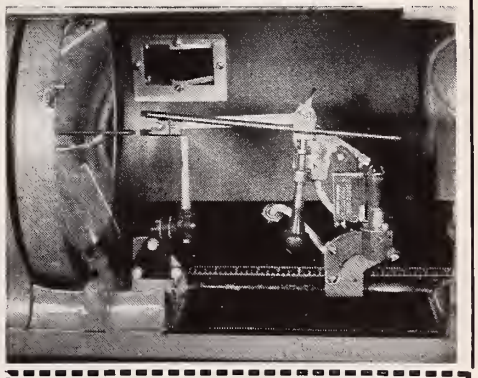
AVAILABLE AT ALL THEATRE SUPPLY DEALERS

FISHER MANUFACTURING CO.
1185 Mt. Read Blvd.
Rochester 6, N. Y.

HOW CARBON COSTS WILL COME DOWN IN YOUR THEATRE

when you have the

CRON-O-MATIC
Fully Automatic
CARBON SAVER



If you have Ashcraft "D" or "E", Brenkert-Enarc, Peerless Magnarc, or Strong Mogul projection lamps you can save $400.00 annually by investing only $42.50 in this great money-saver. It pays an average return of 900% on your investment.

Uses positive carbon stubs of any length, without preparation. When entirely consumed, the new carbon goes into use without losing the light, or otherwise affecting lamp operation. Burns average lengths (3¼") down to ¾" saving 2½" or 22.2% of carbon costs. If your dealer can't supply you, order direct.

PAYNE PRODUCTS CO. *(Cron-O-Matic Division)*
2454 W. Stadium Blvd., Ann Arbor, Mich.
( ) Send literature on the Cron-O-Matic.
Ship Cron-O-Matic ( ) C.O.D. inc. postage.
( ) Remittance herewith.

NAME .....
THEATRE .....
STREET .....
CITY & STATE .....
EXPORT: Frazar & Hansen, Ltd.,
San Francisco, New York, Los Angeles

AUTOMATIC
Carbon Savers
All Sizes: 7-mm to 13.6-mm
Advise: Arc Type—Pos. Size
--DOC FAIGE & ASSCTS., 630 9th Ave., NYC--

YOUR BEST BUY
U. S. SAVINGS BONDS

multilayer color. (The thicker the emulsion, the less the gain in running time due to the thinner base.)

The large amount of polyester thin film that can be wound upon reels of standard size does not necessarily indicate an appreciable saving in storage and shipping costs. However, the longer running time per reel of polyester thin film should be of advantage to projectionists and exchange workers, forasmuch as it would in some cases permit the mounting of 7-reel features on 3 instead of 3½ double reels, 9-reel features on 4 instead of 4½ double reels, etc. It all depends on just where the laboratory cutters prefer to make the reel divisions. Mid-scene cuts are tabu; and fades are preferable for dividing to editors' intercuts.

Toughness of Polyester

Limited use of polyester theatre-release positive in the field confirms manufacturers' claims of longer print life. Polyester film is extremely resistant to tearing and sprocket-hole damage. While this would be a decided advantage in leader footage (if the polyester film could be spliced as easily and quickly as ordinary film), such great wear-resistance in the main picture portion of the reels seems unnecessary to the writer.

Triacetate and nitrate release-print leaders wear out rather rapidly and frequently have to be replaced during the active life of the prints. The perforations become torn by the strain of accelerating projector speed; and the edges of the leaders are often roughened and cracked by repeated threading up in projectors having slightly misaligned pad rollers. Careless threading usually tears out the sprocket holes completely. Unless film damaged in this way is repaired, a loop will be lost and the film will break. Polyester film leaders, on the other hand, are so tough and resilient that nothing short of misthreading will rip out the perforations or break the film.

A not yet completely solved problem with regard to polyester and other polymer-type projection prints is their resistance to solvent fluids from which quick-acting film cements are made. True, an adhesive-tape joining material (similar to Scotch tape but much thinner) has been devised for splicing polyester film; and when such joints are protected from moisure they last a long time. Glues formulated for polyester film require considerably longer setting time than conventional cement. Also, these splices, even at their best, are not so strong as regular nitrate and triacetate splices made with solvent liquids.

Polyester prints will undoubtedly suffer less damage than triacetate prints, necessitating fewer repairs; but trailer films, especially when assembled with date strips, advertising titles, etc., will require the usual number of splices regardless of the chemical nature of the base.

The "rubbery" quality of certain experimental samples of polyester thin film is demonstrated by its "buckle range" at the aperture of a projector. Now, the normal "negative" bulge assumed by fresh nitrate film causes the center of the frame at the aperture to be displaced about 0.020 of an inch toward the lamphouse when projected with an HI arc burning 75 amperes. Triacetate film undergoes a 0.025-inch displacement under the same conditions, while both polyamide and polyester films are displaced at the center of the frame by as much as 0.040 of an inch.

Negative Buckling

A negative "pincushioning" as large as this is not at all detrimental to focus as long as it maintains a constant value. In fact, negative bulging of the film frames may improve the flatness of field of the projected pictures. But whereas both nitrate and triacetate films have a normal flutter range of less than 0.001 inch at 75 amps., polyamide and polyester thin films flutter by as much as 0.002 inch under the same conditions. This is close to the focus tolerance of fast projection lenses of short focal length, and at higher currents, this flutter increases.

It can be said in conclusion that cellulose triacetate film is as long-lasting as nitrate, and when the projector mechanism is properly adjusted, gives screen results comparable in every way to those obtained with nitrate. Because it is not yet completely out of the development stage, it is not possible now to evaluate the performance of the new polyester film base. It can only be said that, so far as is known at present, it has a number of advantages but also some disadvantages over triacetate and nitrate.

Q: **When is a mistake a blunder?**

A: **When a projectionist is not a regular subscriber to IP—a MUST reading for the projectionist craft.**

Use the handy order form below

INTERNATIONAL PROJECTIONIST
19 West 44 St., New York 36, N. Y.

Enter my subscription for ☐ 1 year (12) issues—$2.50
☐ 2 years (24) issues—$4.00

Foreign and Canada: Add 50c per year

Name .....

Address .....

City ..... *Zone* ..... *State* .....

Navy Buys Screens, Lenses

To convert its theatres to widescreen projection, the Navy Dept. recently purchased a large quantity of Raytone screens. Altec Service Corp. of New York helped expedite the transaction between the Navy and the Raytone organization. An additional purchase of a number of Projection Optics lenses was also contracted for by the Navy through Raytone, distributor of the lenses.

"I was pickin' pansies in Belleau Wood"



THEY WERE only a handful of dirty, haggard Marines. Paralyzed, they hugged the earth outside Lucy le Bocage as murderous German fire poured at them. And then they heard their little, middle-aged sergeant:

"Come on, you ---- -- -------!
Do you want to live forever?"

That yell, and the charge that followed, made Sergeant Dan Daly famous. But he wanted no glory. He already had *two* Medals of Honor, one earned in Peking, the other in the jungles of Haiti.

And when reporters asked about his World War I decorations, he said: "I was out in Belleau Wood pickin' pansies for my girl one day. And the officers said: 'Let's give the poor guy a medal.' Well, sir, they give me the DSC . . ."

No hero to himself, Dan Daly was a fearless and expert professional soldier—one of a breed some folks don't expect of a wealthy, peaceful land like America. Yet America's ability to produce men like Daly is a more important clue to her strength than all the gold at Fort Knox.

For it is Americans by the millions that make our nation great. And it is their priceless strength that backs our country's Savings Bonds.

That's why there's no finer investment in the world than these Bonds. Invest in them regularly, and hold on to them.



It's actually easy to save money—when you buy Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done *for* you. The Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, when held to maturity. And *after* maturity they go on earning 10 years *more*. Join the Plan today. Or invest in Savings Bonds regularly where you bank.

Safe as America – U.S. Savings Bonds

The U.S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

PUBLIC SERVICE ADVERTISING COUNCIL

"ME AND MY SIMPLEX . . .

. . . u-m-m-m how can you help but fall in love with the smoothest running, most dependable projection and sound mechanisms ever built? Believe me . . . any projectionist that hasn't experienced the all-around ease of operation and simple maintenance of a Simplex system really has a thrill in store!

Next time you talk to the boss about equipment . . . talk Simplex!"



Simplex
T.M. REG. U. S. PAT. OFF.

PROJECTION and SOUND SYSTEMS

MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION • DISTRIBUTED BY NATIONAL THEATRE SUPPLY

SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

B 601514
JUN

INTERNATIONAL PROJECTIONIST



JUL 20 1956

JUNE 1956

VOLUME 31 • NUMBER 6

30c A COPY • $2.50 A YEAR

No lamp in the World!

CAN PRODUCE SO MUCH LIGHT.

Peerless HY-CANDESCENT TRADE MARK REG

CINEARC

NOT A REFLECTOR ARC!

WRITE FOR DATA

Peerless MAGNARC TRADE MARK REG

CINEARC

A 75-77 AMP. REFLECTOR ARC!

22,000 TOTAL LUMENS ON SCREEN

NO-HIGH-RATE *OF ($60.00) REFLECTOR BREAKAGE AND SILVERING DETERIORATION OR HEAT FILTER UPKEEP* !

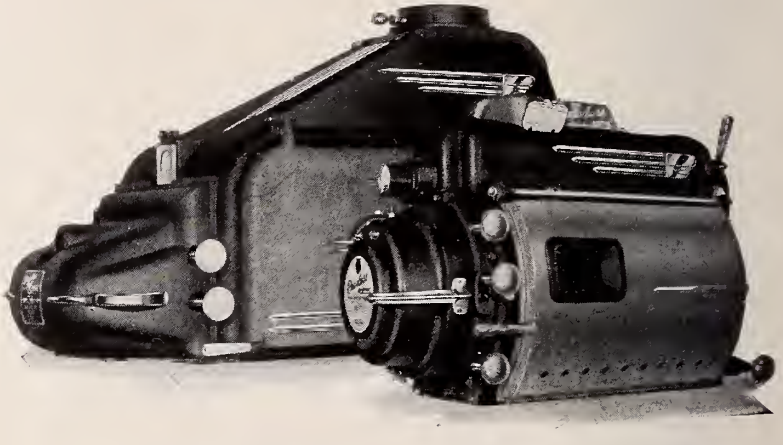
PROOF

Hy-Candescents were selected for all **important** "CINERAMA" installations. (Chicago, New York, Los Angeles, San Francisco, Philadelphia, and Washington, D. C.)

Hy-Candescents were chosen by Paramount for **all** installations of Horizontal "VISTA-VISION".

Hy-Candescents were again selected by TODD-AO for "OKLAHOMA".

You have to do the same if you want all the light there is for big pictures.



At 75-77 amperes . . . With presently available and standard 8 x 9 m/m copper coated carbons . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . With a 14" diameter No. 2012 PEERLESS "Hy-Lumen" glass reflector that retails at a list price of $22.00 F.O.B. Chicago . . . With a No. 2880 PEERLESS Tail Flame Flue . . . On any kind or any size screen . . . No Heat Filter required.

All of this, at the **lowest** possible first, and operational **cost**. And

J.E.McAULEY MFG.CO.

552-554 WEST ADAMS STREET

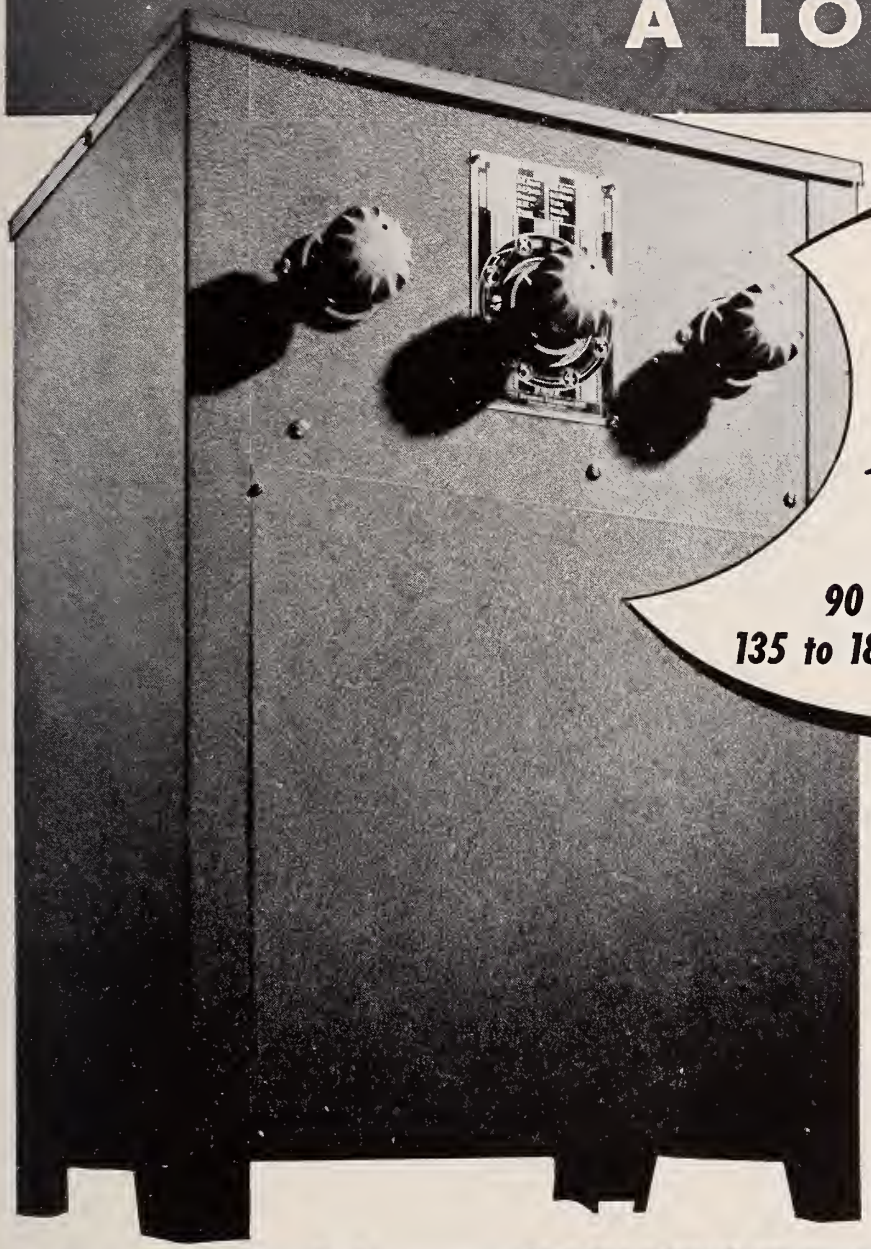
CHICAGO 6, ILLINOIS

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

B 601514

JUN 22 1956

THE FINEST RECTIFIER EVER OFFERED AT SUCH A LOW PRICE!



The New "Red Arrow"

Selenium Rectifier
90 to 135 Ampere and,
135 to 180 Ampere Models

Engineered by arc lamp and rectifier specialists for utmost ecanamy and peak efficiency in canverting three-phase A.C. current to D.C. for use with angle or coaxial trim high intensity lamps.

Canvenient output control.

Moisture-proaf selenium plates insure reliable operatian in damp climates.

Plates cooled by heavy duty fan.

Heavy gauge sheet metal case.

Send coupon today for complete information.

THE STRONG ELECTRIC CORPORATION

31 CITY PARK AVENUE • TOLEDO 1, OHIO

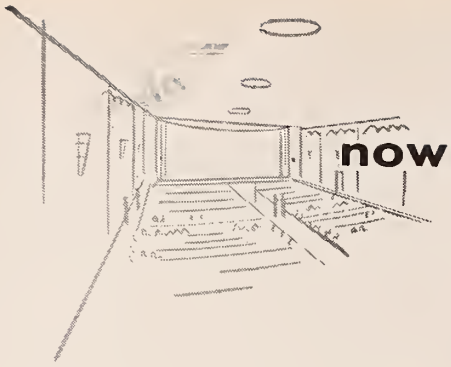
Please send free literature on Strong Rectifiers.

NAME_____

THEATRE_____

CITY & STATE_____

NAME OF SUPPLIER_____



now! profit without problems

NEW VICRA-LITE

LENTICULAR SCREEN

"the screen of optical precision"

offering the first great improvement in maximum light distribution & reflection—yet priced lower than ordinary "half-there" screens!

features:

- **amazingly low cost**
- **maximum reflection**
- **greatest distribution**
- **no disturbing seams**

What's a "half-there" screen? It's a screen that deprives half your patrons of the brightness and original clarity of the fine new films you're showing. Now, with L. E. Carpenter's just developed screen—employing all of the important scientific findings of Lenticulation—you're assured of top light distribution and reflection. That adds up to *more* satisfied patrons—*more* box office sales—MORE PROFITS FOR YOU!

Get the complete facts now, today! Contact your local theatre supply dealer for prices, or write, wire or phone us for our factual booklet.



L. E. CARPENTER & COMPANY

VICRA-LITE SCREEN DIVISION • Empire State Building, New York 1, N.Y. • LO 4-0080 • Plant: Wharton, N. J.

International PROJECTIONIST

R. A. ENTRACHT, *Publisher*
JAMES MORRIS, *Editor*
R. A. MITCHELL, *Contributing Editor*

Volume 31 **JUNE 1956** **Number 6**

Index and Monthly Chat 5
A Common Sense Approach to Screens, Apertures and Aspect Ratios 7
ROBERT A. MITCHELL
Are Your Switchboards Confusing? 12
RITZ MILLER
Drive-ins No Longer Fear Tinted Windshields ... 13
Eidophor May Revive Lagging Theatre-TV Operations 14
NORMAN WASSERMAN
Letters to the Editor 17
Modernizing Equipment at Military Theatres in the Far East 18
ROBERT A. HAINES
Roadshow Sound System for "Carousel" 22
LORIN D. GRIGNON
In the Spotlight 23
Number of Operating Theatres Remains Stable Despite Boxoffice Decline 25
Brushup on Fundamentals 26
Boxoffice Patterns Traced Over the Past 10 Years.. 27
Careful Maintenance Is Key to Quality Drive-In Projection 28
E. J. NELSON
New Products for the Industry 29
Witnesses at Senate Hearings Denounce Toll TV .. 29
Westrex Marketing New Sound Equipment 30
Personal Notes 30
Book Reviews 31
Obituaries 33
Miscellaneous Items, News Notes, Technical Hints

INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co., Inc., 19 West 44 Street, New York 36, R. A. Entracht, President. Telephone: MUrray Hill 2-2948. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States and U. S. Possessions, $2.50 per year (12 issues) and $4.00 for two years (24 issues). Canada and Foreign countries: $3.00 per year and $5.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Entered as second-class matter February 8, 1932, at the Post Office at New York, N. Y., under the act of March 3, 1879. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1956 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

420

Monthly Chat

Fox Policy on Sound

THE REPORTED decision of Spyros Skouras, president of the 20th Century-Fox, to respect the wishes of a majority of producers with regard to magnetic sound indicates that industry leaders are now working to reestablish the technical standardization of theatre projection that existed before the advent of the new processes. Beginning shortly with the release of "Bus Stop," Fox is expected to make use of the combination magnetic-optical print. This print was introduced last Fall by M-G-M and is favored by most of the studios as a compromise solution to the problem created by the refusal of many exhibitors to convert their equipment for magnetic sound.

Urging by the other studios, plus the high cost of manufacturing large numbers of expensive magnetic prints for the relatively few theatres equipped to handle them, is said to have brought about the decision by Skouras. CinemaScope prints which previously carried only magnetic soundtracks should soon contain an additional optical track permitting their use in all theatres. CinemaScope prints carrying only an optical soundtrack will continue to be available as before. The combination print was described in detail in the December, 1955 issue of IP.

It is important to remember, however, that 20th Century-Fox and other studios remain strongly in favor of magnetic stereophonic sound and will continue to supply magnetic prints to all theatres possessing the necessary reproducing equipment. Improved sound is not so obvious a development in projection methods as was the big screen, and it is not so readily noticed and appreciated by the movie patron. Many exhibitors continue to feel that it is not worth its price. It might be well for them to consider that quality sound reproduction is probably so natural and unobtrusive that listeners may forget to comment on the pleasure it gives them.

One Man's Contribution

IN CONCENTRATING on industry-wide technical developments, we sometimes lose sight of the great contribution made by individual projectionists who patiently attack and solve the problems they encounter in their daily work. Such a man is Ritz Miller, of Los Angeles, who has worked as an extra man in well over a hundred projection rooms during the past few years.

Miller often found himself in a state of complete confusion because of the haphazard way in which new-process equipment was hooked up to switchboards. When starting at a new house, he would find that many switches were no longer connected, that others were serving for something other than their intended purpose, and that markings were either illegible or nonexistent. What did Miller do about this? Instead of complaining, he has been offering to remove the panels of poorly marked switchboards and do a complete cleaning, painting and reorganizing job on them in his spare time. He uses enamel paint in many different colors and gets results that are both highly decorative and clearly visible even in a dark room. An article by Miller about what he describes as his "hobby" will be found in this issue of IP.



"Want a light, mister?"

Want a really good light on your screen—

regardless of how big—

regardless of the projection process—

regardless of the film width?



EXCELITE "135"

PROJECTION ARC LAMPS

New conversion features ready for your adoption when you equip for wide film presentation include provision for burning 20-inch 13.6 mm carbons, a wider opening in the nose, a dowser which covers the bigger opening, and a new high magnification mirror. The Excelite "135" comes equipped with an 18" f 1.7 or 16-1/2" f 1.9 reflector and burns a choice of 9, 10, or 11 mm regular or 10 mm Hitex carbons, with single control amperage selection. Long-life positive carbon contacts. (Water-cooled carbon contacts optional.) Automatic Crater Positioning System prevents color change in screen light. Air jet arc stabilization keeps tail flame from reflector. Prevents deposit of soot and formation of heat absorbing scum which causes mirror breakage. Blower cooled removable Reflect-O-Heat unit for reducing aperture heat. Unit construction.

IT'S FROM NTS

NATIONAL THEATRE SUPPLY

Division of National • Simplex • Bladewith Inc

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

INTERNATIONAL PROJECTIONIST

VOLUME 31 JUNE 1956 NUMBER 6

A Common Sense Approach to Screens, Apertures, and Aspect Ratios

By ROBERT A. MITCHELL

With the wide screen accepted everywhere, it is a good time to examine present projection methods in individual theatres. The following is the first installment of a two-part article.

THE TREND toward wider-than-normal theatre screens is now so well established that the conventional 4:3-proportioned screen has become a rarity. Only a few theatres have retained the normal screen when wide screens are used for CinemaScope projection, and almost none have changed back to the standard aspect ratio after giving non-anamorphic widescreen pictures a fair trial.

Whether the so-called "panoramic" picture format has visual and artistic merit is a question that has not yet received adequate attention; but it is evident that the great masses of moviegoers all over the world seem to enjoy motion pictures that have a width disproportionately great in relation to height.

The wide screen is obviously here to stay in one form or another. But the inability of the industry to standardize either the widescreen process or the aspect ratio best suited to the rank and file of non-anamorphic pictures, has introduced a number of complex projection problems. The only conceivable advantage in having seven or eight aspect ratios to choose from, together with the coexistence of anamorphic and non-anamorphic prints, would appear to reside in the *flexibility* of present-day projection.

As things now stand, aspect ratios can be chosen to suit the size and shape of the proscenium opening of each individual theatre. But that's the only advantage, for pictorial results on the wide screen are frequently bizarre, and image quality less than good.

Figure 1 shows the relative sizes of several widely used aspect ratios when lenses are selected to maintain the same picture height on the screen.

Screen Height Important

In general, long, narrow theatres need greater picture height (or what amounts to the same thing, less picture width) than do theatres having wide auditoriums and stages. The maximum CinemaScope aspect ratio (2.35/1 for optical-track, and 2.55/1 for magnetic-track, film) should be used in all theatres having sufficient stage width to accommodate the super-wide screens without having to reduce the vertical dimension of the screen.

A proscenium opening nearly square in shape, or higher than wide, requires so severe a reduction of CinemaScope-screen height as to impart a "mailbox-slot" appearance to the picture. In some theatres of this type, the CinemaScope screen is actually smaller vertically than the old normal screen! A reduced-height CinemaScope screen looks absurd; and it is better to reduce the width, when absolutely necessary, by using a 2/1 aspect ratio.

Wide theatres having screens of extreme aspect ratios, on the other hand, sometimes install screens too big to be comfortably viewed, and upon which the short-focus lenses project grainy, out-of-focus images. Visibility, not mere hugeness, is the goal to aim for when selecting a size of screen for a theatre. Patrons respond to excessively large screens by sitting farther away from the picture; and the front rows of seats remain empty most of the time.

Although CinemaScope is comparatively free from graininess and the film-buckling effects revealed by short-focus lenses, it offended the eyes of moviegoers at the time of its inception by the curved-screen fad. As a rule, the radius of curvature of the new CinemaScope screens was equal to the projection throw—a curvature great enough

to distort the picture, especially where steep projection angles prevailed. Horizon lines curved upwards at the sides of the picture; trees and buildings bent inward at the top of the screen.

An Early Accomplishment

Theatre motion pictures reached their peak of pictorial perfection in the middle 1920's when all movies were silent. They maintained a high degree of technical excellence, with only occasional lapses, up until the advent of the wide screen in 1953. Clear, brilliant, rocksteady movies were taken for granted. And then the normal 4:3-proportioned screen (1.333/1 aspect ratio) was swept away, and with it went all the old sharpness and "snap." The wide screen seriously reduced picture quality.

The conventional screen-format, in fact, not only assisted the technical perfection of the motion picture, but made possible the dramatic power and emotional intimacy responsible for the commercial success of the movies as a story-telling medium. But audiences change with the times: the moviegoers who thrilled to Garbo, Gilbert, and Swanson turned their backs on the 1930 Fox big-screen attempt known as "Grandeur."

It was felt then, and it is true now, that the normally proportioned screen is better suited to the requirements of flexible motion picture photography and rapid cutting, and better lends itself to the esthetics of dramatic production. In addition, the conventional 1.333/1 aspect-ratio screen has a shape closely corresponding to the natural field of direct vision, and is therefore "unobtrusive" to the patron who expects to "lose himself" in the make-believe of a well-conceived, well-produced, and well-projected photoplay.

Rounded Screen Corners

The esthetic character and psychovisual unobtrusiveness of the normal screen was enhanced from the earliest days of the movies by *rounding* the corners of the rectangular picture area. Square corners, it is known, are sharp points of distraction which tend to draw the eye away from the center of pictorial interest—the middle of the screen.

The wider screen, and especially CinemaScope, reduced the natural ease of motion-picture viewing by scattering points of interest all over the extended screen area. The esthetic character of the normal aspect ratio was thereby destroyed; and such niceties of presentation as the avoidance of irritating eye- and attention-distracting influences become virtually useless.

Not only did the CinemaScope screen (and wide screens in general) have angular corners and the handicap of faulty picture framing in dramatic closeups and intimate scenes, but even when flat screens were used to avoid the geometric distortions of screen curvature, the black velour border which masks the screen was often bowed, top and bottom, to *simulate* the *appearance* of a curved screen! Bowed, or curved, screen masking is a visual horror: it is discordant to straight lines in the picture—the ugliest type of picture-masking imaginable.

Excessive aspect ratios (those greater than 1.66/1) necessarily run counter to certain psychovisual principles of dramatic cinematography and presentation *via* the projection process; but the use of curved screen borders violates every law of satisfactory screen framing. Our discussion of screen masking titled "Psychological Elements in Projection" (IP for May 1949, p. 14 *et seq.*) is still as valid as ever.

Without taking into account Cinerama, Todd-AO, Plastorama, and other cinematic roadshow processes, it may be stated unequivocally that flat screens for both CinemaScope and non-anamorphic projection are superior to curved screens. Focus is better, a satisfactorily oriented image can be seen from a wider angle of viewing, and there is no distortion of horizontal lines even when steep projection angles prevail, or when the picture is viewed from positions far away from the projector-to-screen axis.

The use in wide theatres of aluminum-surface *flat* CinemaScope screens is tabu on account of their bad distribution of light. If aluminum screens *must* be used for CinemaScope, they should be curved for better light distribution throughout the auditorium in spite of the intolerable distortions of screen curvature. The only exception to this rule is the long, narrow theatre.

The use of flat aluminum screens in wide theatres results in a spurious "hot spot" that changes its position according to the location of the observer. To patrons seated in the middle of the theatre, the picture is brightest at its center; to those in side seats, the picture is bright on their own side and dim on the far side.

Matte Surface Preferred

When in doubt as to what type of screen to use, install a flat *white* screen. Mandatory for wide theatres, matte screens are best for all but the longest, narrowest theatres. It is also well worth remembering that many aluminum-surface screens, in addition to their inherently uneven light distribution, are often overrated as to reflective power.

Few aluminum screens attain as much as 120%—150% center reflection after a year of use; and the

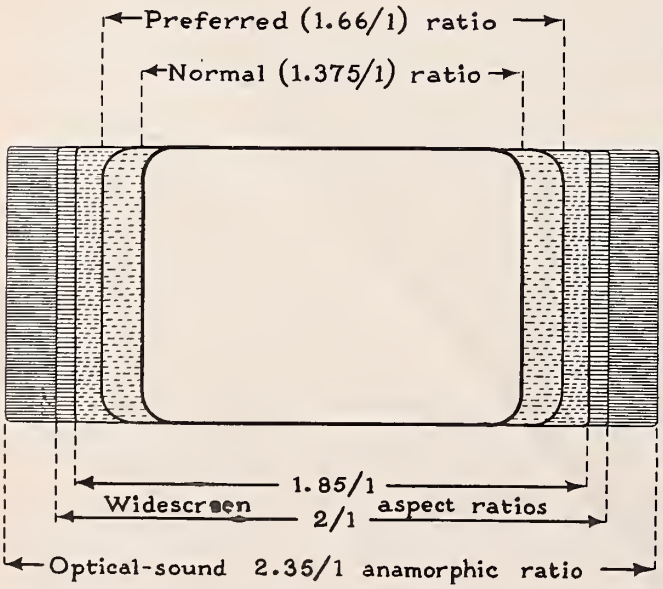
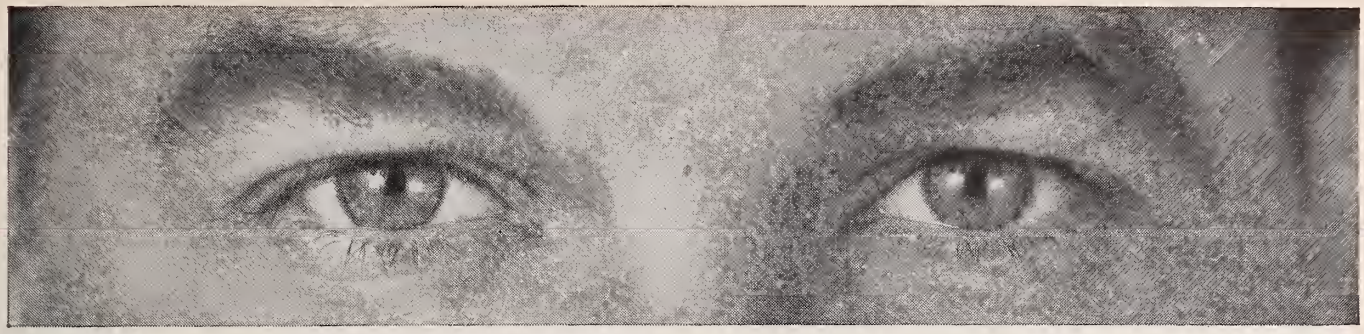
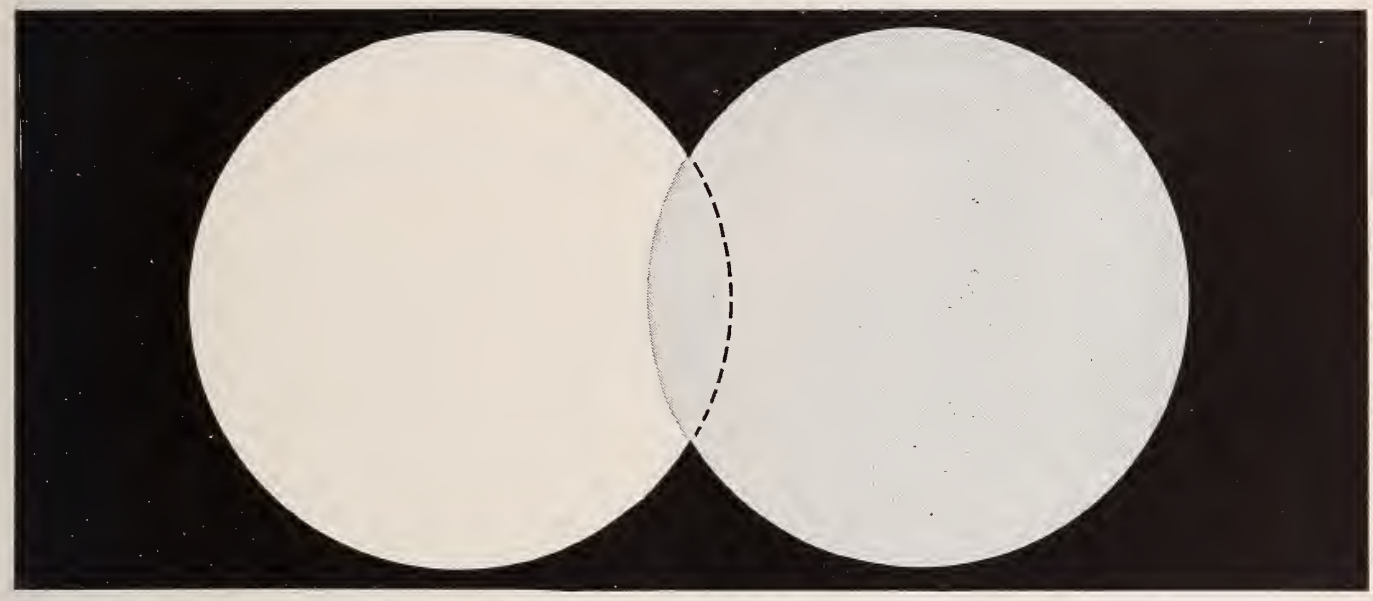


FIG. 1. Various aspect ratios compared, picture height remaining the same. The normal 1.375/1 a. r. (aspect ratio) is obtained with the standard soundfilm 0.825" x 0.600" aperture. The most popular non-anamorphic widescreen a. r. is 1.85/1, obtained with an aperture measuring 0.825" x 0.446". More satisfactory than this from the point of view of photography, dramatic naturalness, and projection quality is the 1.66/1 (or 1.65/1) a. r., the aperture measuring 0.825" x 0.497" (or 0.825" x 0.500"). Aspect ratios of 2/1 and greater are obtained with "squeezed-image" prints and anamorphic lenses. The standard a. r. for optical-sound CinemaScope, for example, is 2.35/1 obtained with a 0.839" x 0.715" aperture.



You can see the difference...



WITH THE NEW NATIONAL TRADE-MARK 11 mm H. I. PROJECTOR CARBON

• 10% More Light • Up to 25% Slower Burning

■ There *is* a noticeable difference in 10% more light. One of the circles above is as white as the paper it's printed on and is exactly 10% brighter than the other circle. You can *see* the difference, just as your customers can see the difference on your screen when you change to the new "National" 11mm x 20″ High Intensity Carbon.

The past few months have seen constant improvement in the line of "National" Carbons. New "Suprex" 7mm and 8mm Carbons, a new 10mm High Intensity Carbon and now a tremendously improved 11mm High Intensity Carbon to bring you still more light on the screen at minimum cost.

Prove to yourself that the oldest and most extensive arc-carbon research and development program does pay off for you — in quality *and* in savings.



THE PICTURE IS LIGHT... GIVE IT ALL YOU CAN WITH "NATIONAL" CARBONS

The terms "National" and "Suprex" are trade-marks of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY • **A Division of Union Carbide and Carbon Corporation** • ***30 East 42nd Street, New York 17, N.Y.***

SALES OFFICES: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco • **IN CANADA:** Union Carbide Canada Limited, Toronto

You Pay for the Light

—BE SURE YOU GET ALL OF IT!

When you reduce the size of the spot of the ordinary spotlight you must mask out, or iris down, part of the light beam, thus wasting much of the available light.

BUT —when you have a spotlight with a two element variable focal length objective lens system, an exclusive feature of Strong spotlights—the brilliance of the spot actually increases as it is reduced in size. Both lenses are simultaneously controlled by one operation.



Strong

TROUPERETTE INCANDESCENT SPOTLIGHT

Sparkling, flickerless light aplenty for your show, concert, play, dances and special events. A sharp edged spot from head to flood. Fast-operating, 6-slide color boomerang. Horizontal masking control angles 45° in either direction. Mounted on casters for easy portability. Plugs into any 110-volt outlet.

There's nothing to compare with a Strong spotlight, say all those who own one or have seen one.



Strong

FULLY AUTOMATIC ARC SPOTLIGHTS

For projecting a powerful, snow-white light in large auditoriums.



THE TROUPER

Adjustable self-regulating transformer in base.



SUPER-TROUPER

Direct current high intensity with built-in power conversion unit.

Among the dealers who have Trouperettes and will gladly arrange a demonstration are:

ALABAMA — Montgomery Photo-Sound, Inc., 166 Church St.
CALIFORNIA — Berkeley Stagecroft Studios, 1854 Alcotroz Ave.
Fresno: Midstate Theatre Supply, 1906 Thomos
Los Angeles: C. J. Holzmueller, 2533 S. Hill St., Pembrex Theotre Supply, 1969 S. Vermont Ave.
8. A. Sheorer Co. 1964 S. Vermont Ave.
Redwood City: Associated Lighting Service, P.O. Box 1033
San Francisco: C. J. Holzmueller, 1108 Howord St.
W. G. Preddey Theotre Supplies, 187 Golden Gote Ave.
Western Theotricol Equipment Co., 337 Golden Gote Ave.
CONNECTICUT—Hartford 1, Horrison Harries, 110 High St.
ILLINOIS—Chicoga, Gordner Theotre Service Inc. 1314 W. Wobash Ave.
Grond Stoge Lighting Co., 23 West Hubbard St.
National Theatre Supply, 1325 South Wabosh Ave.
INDIANA — Indianapolis, Ger-Bor Inc., 442 Narth Illinois St.
Union City: Projection Equipment Co., 40B Plum St.
KANSAS—Topeka, Fred M. Wolls, Theatre Service Co. Inc., 827 Wayne St.
KENTUCKY—Louisville 2, Falls City Theotre, Equipment Co., 427 So. Third St.
LOUISIANA—New Orleons, W. H. Bower, Spangenberg, Inc., 1010 Central Ave.
MASSACHUSETTS — Bostan 16, Major Theotre Equipment Corp., 44 Winchester St.
MICHIGAN — Detroit, Albert F. Runnel Studios, 4767 14th St.
MINNESOTA—Duluth 2, Nationol Equipment Co., 7 East Michigan
Minneapolis 3, Notionol Theatre Supply, 56 Glenwood Ave.
MISSISSIPPI — Jackson, Jacksan Theotre Supply Co., 414 West Capitol St.
MISSOURI — Kansas City, Great Western Stoge Equip. Co., Inc., 1324 Grand Ave.
MONTANA — Great Falls, Northern School Supply
NEBRASKA—Omoha Quality Theatre Supply Co., 1515 Davenport St.
NEVADA — Las Vegos, Stage Sound and Equipment Co., 1500 S. Main St.
NEW YORK—Albany, Albany Theatre Supply Co., 443 North Pearl St.
Buffalo 2: Natianal Theotre Supply, 500 Peorl St.
New York City: Amusement Supply Co., Inc., 346 W. 44th St.
Camera Equipment Co., 1600 Broadway National Theatre Supply, 356 W. 44th St.
Norpat Soles, Inc., 113 West 42nd St.
Syracuse: J. R. Cloncy, Inc., 1000 West Belden Ave.
NORTH CAROLINA—Charlatte, Standard Theatre Supply Co., 219 S. Church St.
GREENSBORO: Stage Decoration & Supplies, 620 Jayner St.
Stondord Theatre Supply, 215 E. Washingtan St.
NORTH DAKOTA — Fargo, Northern School Supply
OHIO—Akron 13, Charles Hermann, Electricol Soles, 206 S. Howkins St.
Columbus 15: Schell Scenic Studio, 581 S. High St.
OKLAHOMA — Oklahoma City 2, Notional Theotre Supply, 700 West Grand Ave.
OREGON — Portland 9, Northern School Supply, 1505 N.W. Lovejoy
PENNSYLVANIA — Harrisburg, J. P. Lilley & Son, 92B N. Third St.
Philadelphia 7: Nationol Theotre Supply, 1225 Vine St.
Pittsburgh 22: Appel Visual Service, 927 Penn Ave.
Reading: Hollywood Film Service, 841 Penn St.
TENNESSEE—Memphis National Theotre Supply, 412-414 South 2nd St.
TEXAS—Dallas, Harry Little, 10501-03 Hines Blvd.
Natianol Theotre Supply, 300 South Harwood St.
WASHINGTON — Seattle Disploy Lighting, 2110 Western Ave.
Northern Schoal Supply, 2603 First Ave.
Spokane: Northern School Supply
WEST VIRGINIA—Huntington Theotre Service & Supply Co., 1019 10th St.
CANADA
ALBERTA—Calgory Shorp's Theatre Supplies Ltd., Film Exchange Bldg.
MANITOBA — Winnipeg Generol Theatre Supply Co. Ltd., 271 Edmonton Street
ONTARIO—Taronto Generol Theotre Supply Co. Ltd. 861 Bay St.
QUEBEC—Montreol Perkins Electric Co. Ltd., 1197 Phillips PL.
Quebec: La Cie Mortineau E'lectrique Limited, B60 Est Rue Du Roi

THE STRONG ELECTRIC CORPORATION

31 CITY PARK AVENUE • TOLEDO 2, OHIO

Please send free brochures and prices on Strong ☐ Trouper; ☐ Trouperette; ☐ Super-Trouper. ☐ Please arrange a demonstration on the Trouperette.

NAME_____

SCHOOL_____ THEATRE_____

STREET_____

CITY & STATE_____

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

reflection of light at the maximum viewing angles prevailing in the average theatre is usually no greater than 25%—30%. Perforated white screens have a uniform reflection of from 70% to 80%, depending upon age and condition, and provide greater resolution of fine pictorial detail and a more natural rendition of photographic densities and color.

The topic of *rounding* the four corners of a screen is not entirely *passé* in this age of wider-than-normal screens. It has been adequately demonstrated that round corners on conventional 4:3 screens make the edges of the screen—the boundaries of the picture—literally "melt away" from the consciousness of the viewer as he more quickly becomes absorbed in the unfolding drama.

Previous discussions of round screen corners, however, have been concerned only with conventional screens of from 1.333/1 to 1.375/1 aspect ratio. What about screens of greater a.r.?

This writer feels very strongly, and not without reason, that screens proportioned to aspect ratios of 1.65/1 and 1.66/1 (the two are indistinguishable) are most pleasing with round corners made with a radius of curvature equal to 1/12, or 0.083, of the screen height. We also believe that screens of greater a.r. (1.75/1, 1.85/1, 2/1, 2.35/1, and 2.55/1) are *not* improved by round-corner masking.

Most theatres, unfortunately, do not possess the facilities for interchanging two screens, one with rounded corners for non-anamorphic 1.375/1 or 1.66/1 a.r. projection and the other with square corners for anamorphic 2/1, 2.35/1, or 2.55/1 CinemaScope showings.

Two-Screen Theatres

Projectionists who work in theatres able to handle two screens by "flying" the front, and smaller, screen, should seriously consider the proposition of either (1) restoring the front screen to the normal 1.333/1 or 1.375 a.r. or (2) masking it to an a.r. of 1.65/1 or 1.66/1 for *all* non-anamorphic films, including VistaVision prints. Whichever a.r. is selected, the "front" round-corner screen should be used for all regular prints, and the "back" square-corner widescreen reserved exclusively for CinemaScope and SuperScope.

While we are on the subject of prints, let us voice a vigorous protest against the practice of issuing non-anamorphic

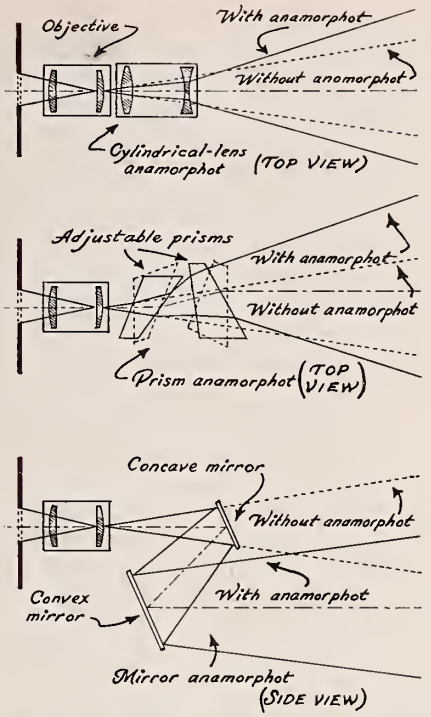


FIG. 2. The three types of anamorphic optical system: cylindrical-lens, prismatic, and cylindrical-mirror. Each type of attachment requires a regular projection objective ("prime," or "backing," lens), and each has its own advantages and disadvantages.

prints having wide aspect ratios *on the film*. Such prints are recognized by their thick framelines—framelines so wide that they show along the top and bottom of the screen when the normal 1.375/1 a.r. projector aperture is used.

All regular non-anamorphic films are supposed to be photographed with a standard soundfilm camera aperture measuring 0.87" x 0.64". This size of film-frame is large enough to be shown with the regular soundfilm projector aperture (0.825" x 0.600") and allow a little leeway for framing and lateral guide-roller adjustment. A camera or printer aperture smaller than this standard is a nuisance to projectionists who show non-anamorphic prints with the normal aperture.

CinemaScope employs somewhat different camera and projector apertures to utilize practically all of the picture area of the film. Being an anamorphic process, CinemaScope requires a special lens attachment, the function of which is to expand the squeezed images on the film to normal proportions. The projectionist may grumble at the frequent quick changes of apertures and lenses he must make when both regular and anamorphic films are run on the same program; but beyond that, and aside from the use of magnetic stereophonic sound, optional with CinemaScope, the anamorphic process is a marvel of simplicity and is capable of giving superb screen results when the optical apparatus is of good quality.

Anamorphic Lens System

As shown in Fig. 2, there are three types of optical system used as "anamorphots" for CinemaScope and SuperScope projection. The cylindrical-lens anamorphot was invented by P. Rudolph (Germany) in 1899 and applied to cinematography by the late Henri Chrétien of France in the late 1920's. Chrétien's cylindrical lens, called a "hypergonar," was applied to commercial movie-making in 1953 by 20th Century-Fox.

There is a close optical resemblance between the hypergonar and the simple optics of the common opera-glass. In the opera-glass there is a positive (convex) object-lens and a negative (concave) eyepiece-lens. But whereas the lenses of the opera-glass are spherical, those in the hypergonar anamorphot are cylindrical, producing magnification in only one dimension, the horizontal. The positive cylindrical object-lens of the hypergonar faces the projection objective, while the negative cylindrical "eyepiece" faces the screen.

It is important to remember that the hypergonar, like all other anamorphots, magnifies the image in only the horizontal dimension and produces no magnification of the vertical dimension whatsoever. But like the simple opera-glass, the hypergonar must be focused by changing the distance between its two elements. If the hypergonar isn't properly focused for the prevailing projector-to-screen distance, all vertical lines in the image will be blurred.

The prismatic anamorphot, consisting of two large achromatic prisms usually mounted so that they may be turned in toward each other or out away from each other, expands the image by any desired amount, within limits. The "expansion factor" of cylindrical-lens hypergonars, on the contrary, is fixed and cannot be changed. For CinemaScope and SuperScope, the expansion factor is 2. An anamorphic-film process proposed by Paramount was to make use of an expansion factor of 1½. All commercial prismatic attachments, accordingly, are provided with a knob for turning the prisms and altering the horizontal expansion of the screen image.

The prismatic anamorphot is a real

(*Continued on page* 38)

Are Your Switchboards Confusing?

By RITZ MILLER
Member, IA Local 779, Ely, Nevada

A Los Angeles projectionist, who has worked as an extra man in many theatres there, has the extremely useful hobby of repainting and relettering projection room switchboards. The results could be considered works of art.

SWITCHBOARDS located between machines in projection rooms are often extremely confusing. I know because I have worked as an extra man in over 150 theatres in two major cities. Since we projectionists live a large part of our lives in the projection room, I think we should try to keep it neat and well organized even though we can't make it look like home.

A projectionist told me recently that when he goes to work in a new house, he turns every switch on and off to see if it really works. I do the same thing myself because I can't depend upon the way switches are presently marked. Also, some work and others don't.

Old and Dirty Labels

Another trouble is that the front wall and switchboards of many projection rooms are both painted a dull black. In poor light you can't even see them. In addition, the past few years have brought many changes in switchboards with controls being installed for 3-D, wide-screen and CinemaScope masking, color wheels in place of curtains, etc.

In many cases small metal frames are riveted above or below each switch on the boards, with small cardboard tabs telling what each switch is for. These tabs are usually old and dirty, too small and much too hard to read. If metal frames are not used, a piece of tape is used to mark each switch when marked with paint or grease pencil. If the projectionist who made the markings isn't very good at printing, you can imagine the mess that results. It means real grief for the extra man, because the manager thinks he doesn't know his business.

Take the arc lamp switch for example. You might find it in one of a half-dozen places, such as in the next room at the rectifiers, or it might be behind the machine, or on the side of the lamp at the base. It might even be a pull string from the ceiling.

Theatres with three machines may have 3, 4, or even 5 boards. You can well imagine the grief which exists when switches on one board are not identical with another. More confusion exists when house and stage lights are run through a dimmer and some switches on one board work and others don't. Often, none of them are marked.

The following example is typical of some of the problems an extra projectionist is likely to encounter.

I recall one projection room in a large theatre which contained three machines, but where the left machine had not been used since the installation of CinemaScope. The panel between machines was set up for 16 switches. Since machine No. 1 didn't work, they designated No. 2 as No. 1 but did not mark it as such on the board. Machine No. 3 was called machine No. 2, and lens No. 1 no longer went into machine 1 on the left. It was for the center machine which was actually No. 2 but which was referred to on the panel as No. 1. Douser and arc switches for this machine were listed as No. 2. Number 2 lens went to machine No. 3. How would you like to figure out a puzzle like this on short notice?

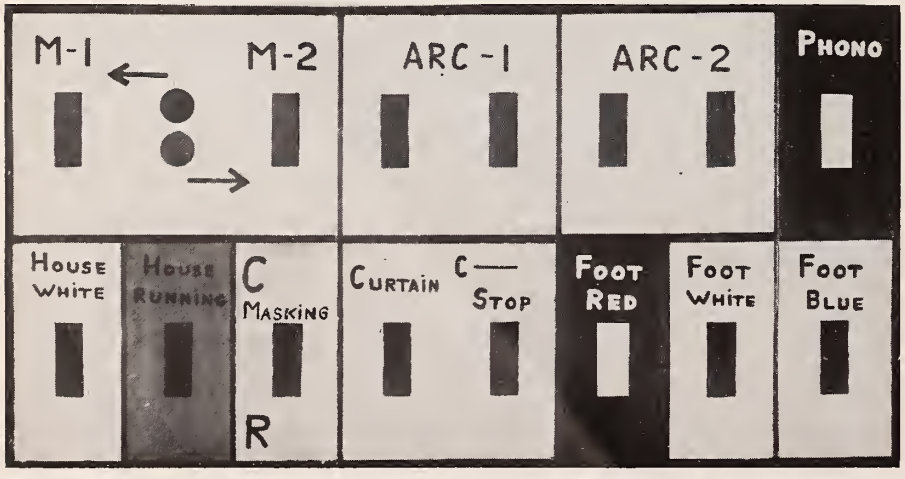
Useless Extra Switches

But that isn't all. One switch near the lower left corner of the switchboard at one station was marked 3-D, while at the next station it controlled the masking stop. At another station it was the arc switch. As if this weren't sufficiently confusing, other switches were either not marked at all or very hard to read.

Another big theatre had four douser switches marked as such in the projection room but only two projectors. Douser switch number 2 worked machine 1; douser 3 worked machine 2. Dousers 1 and 4 would close both machines. The projection room was dark and the labels hard to read. Several other switches didn't work at all.

Now take those older switchboards which have pilot lights for every switch. This causes further confusion. If you glance at them when they are not illuminated in a dimly-lighted room, they look like additional switches. Some pilot lights have such a glare that one wishes that they didn't work. A thin coat of white paint on the back of each lens could eliminate this glare.

Also consider those projection rooms



Example of Ritz Miller's work in organizing and lettering projection room switchboards. Unfortunately, a black-and-white reproduction of Miller's work does not really do it justice because he uses bright enamel paint in various colors so that switches may be more readily identified even in a dimly-lighted room.

which do not have framing knobs, lens knobs, aperture plates and similar parts well marked. This confuses the extra projectionist and results in mistakes.

Projectionists should have some way of getting together and working out a uniform system of marking everything in the projection room. I have a few ideas on the subject which I would like to pass on for what they are worth:

If switch panels are painted white with the area around each switch separated by fairly heavy black dividing lines, it will make things easier. Add a few colors and it works out much better, even in a dark projection room. Each switch could be labeled in a systematic way with dark lettering large enough to be easily seen.

The tools to accomplish what I have in mind are simple and easy to obtain. All that is needed are a screwdriver, sandpaper, single-edge razor blades, flat and round files, a black pencil, a ruler, a small paint brush 1/16th of an inch wide, masking tape, and a supply of small bottles of brightly colored paint, such as the Dupli-Color brand used to touch up scratches on auto bodies. I use white, black, red, green, yellow, blue, and silver or chrome. A small bottle of solvent is also useful.

Cleaning Procedure

Here is the procedure that I follow in painting and lettering switchboards:

First, the metal switchplate is removed and taken over to the workbench where the old paint, adhesive tape, and red crayon marks are scraped off with the end of a screwdriver or flat file.

Small metal tabs riveted or spot welded to the panel can be pulled off and stubs filed down with a round or flat file to provide a smooth surface. Then the board is washed, dried and given a coat of No. 199 Auto White touch-up paint. (Each bottle has its own brush.)

Red China crayon marks are usually hard to remove even after sandpaper has been used. If a red streak shows up after the first coat of white paint, I scrape off the paint and sand down the plate some more.

When the first coat of white paint dries, take the ruler and pencil and draw dividing lines where needed upon the white surface. You may have a little trouble arranging things so that the area around each switch will be more-or-less equal in size. The next step is the second coat of paint. This coat will be of different colors for the areas around each switch. Since Dupli-Color paint will dry in about five minutes, it doesn't take long to complete the whole job even if four or five coats are applied to build up bright distinctive colors. When all the coats are dry, paint in black dividing lines. These lines should be 1/4th inch in width and are painted on with the aid of masking tape. Thin strips of masking tape are easy to pull off later without damage to the paint underneath. After the paint is completely dry, scrape off the rough edges left by the masking tape.

The next step is to label each switch. The lettering is painted above each switch. Since the douser and motor switches are used most frequently, they are usually marked by black lettering on a white background. Red arrows provide excellent contrast for indicating which douser button goes with each switch. I make curtain switches stand out by painting their area a light blue-gray with both black and red lettering.

Phono and color wheel switches are painted red with white lettering. I usually paint footlight switches whatever color the lights may be, usually white, blue, and red. Masking switches used in theatres having CinemaScope can be painted white or silver. I paint arc lamp switches red with large white or red lettering.

Most of the extra men working in different projection rooms around Los Angeles say it is a pleasure to find a switchboard fixed up this way. As I have not been available for work as an extra man much this year, it looks as though others will have to do the painting if many more projection rooms are to be fixed up according to my plan. I've got requests to work on quite a number of projection rooms, but it will be some time before I can get around to all of them.

To me, it's a hobby done in connection with my job. A good switchboard means better working conditions. If a fellow can put on a better show with fewer mistakes, I feel it helps the box-office and keeps good IA men employed.

Drive-Ins No Longer Fear Tinted Windshields

Three years ago, a mild furor was stirred up among drive-in theatre men in opposition to the new "fad" of tinted windshields for automobiles. The complaint had to do with the inevitable fact that this type of windshield filtered away some very valuable light from the screen. Today, however, resentment is declining despite continuing losses in screen brightness and color quality.

Automobile makers have actually increased their production and sales of tinted windshields, while drive-in patrons who have to look through them to the screen are registering few complaints. About the only really disgruntled parties —and with some justification, we might add—are the various safe-driving and eyesight conserving agencies who still maintain that the tinted windshield hinders visibility and represents an acute night driving hazard.

Perhaps the chief reason for the gradual acceptance of tinted windshields by the drive-ins is their own advances made in the area of screen brightness. The development of highly reflective directional screens, improved lamp houses and carbons, as well as greater refinements in all aspects of projection technique, have combined to provide a more satisfactory screen image than has ever been achieved outdoors before. Drive-in technicians, equipment manufacturers, and even Hollywood have all been busy developing new ways to obtain increased screen brightness.

It's Here to Stay

That the tinted windshield—for better or for worse—is here to stay cannot be disputed, judging by the reports of leading auto manufacturers. Ford, for example, issued a statement pointing out that "the use of this type of glass has more than doubled in the past two years." Lincoln declared that customers' preferences for tint have necessitated that over 90% of all '56 Lincolns be equipped that way.

A working peace then has been established between the picture-conscious drive-ins and glare-conscious car builders. However, a number of eyesight and safety-conscious organizations like the Society for the Prevention of Blindness and the Optometric Association, not to mention the Automobile Association of America, are still waging war on the tinted windshield manufacturers. These organizations have opposed tinted windshields ever since they were first introduced. Their claim is that it damages visibility and therefore represents a serious driving hazard at night. Special emphasis is placed on the negative effects the tint has on the human eye at dusk, when day and night slowly merge. At that time, it is said, the adjustment necessary in the eye requires all the help in the form of light that it can get.

Eidophor May Revive Lagging Theatre-TV Operations

Closed-circuit TV, now piped mainly to hotels and public auditoriums, could become very important to theatres when development of the powerful Eidophor system is completed.

By NORMAN WASSERMAN

A CONSPICUOUS omission from the roster of committees participating in the recent SMPTE convention was the one on theatre-TV. It was an absence to take note of because most recent conventions managed to include some committee activity covering the projection of closed-circuit TV in theatres. The lack of such activity at the May meeting may be indicative of a slackening in theatre-TV, but *not* necessarily of closed-circuit in general.

Closed-circuit as a medium of communication via the direct projection of picture and sound is a comparatively young field. It began slowly, then quickly gathered momentum, and as regards theatres is currently experiencing a "rest period," shall we say. When the time for reawakening comes it may start up with a bang, because a stimulant is not far away. Eidophor, a completely new and different closed-circuit system, capable of producing a wide-screen color picture with a high degree of clarity, was originally developed by the Swiss and is now undergoing final development at General Electric for use by 20th Century-Fox. The Eidophor projection system is uniquely adaptable to theatres, as will be explained later.

Hotel Ballrooms Favored

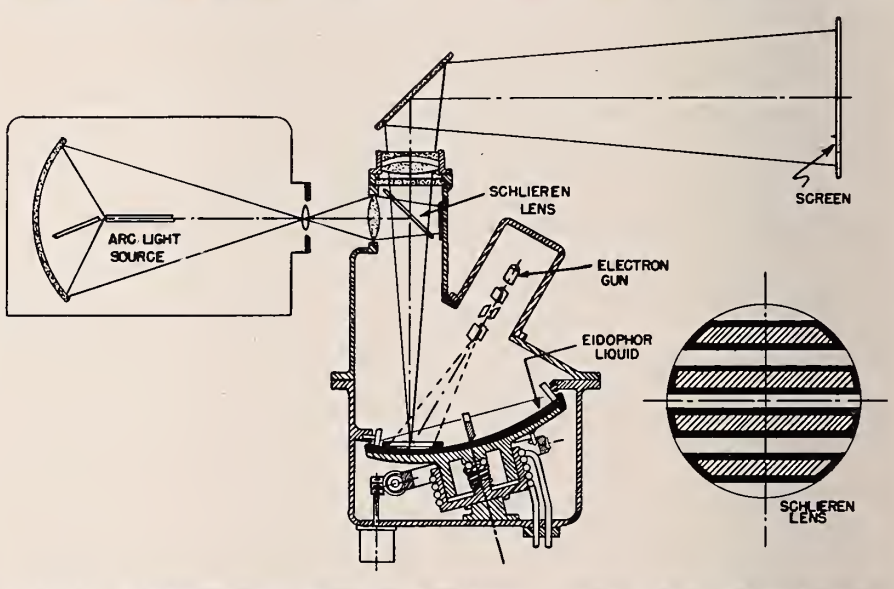
In the meantime, what has happened in effect is that the sponsors of closed circuit programs have gradually taken their business away from the movie houses and into the hotel ballrooms and public auditoriums. A number of explanations can be given for this state of affairs. There is first of all the very nature of closed-circuit to consider. Closed-circuit falls into two very distinct categories: (1) those programs having a general appeal and (2) programs with a limited appeal. By the first category is meant telecast events of a national interest, or at least of wide regional interest. A good example of this was the Marciano-Moore fight last September which was blacked out on regular channels, but shown to eager sport fans throughout the country at selected closed-circuit reception installations, mostly theatres. Programs with limited appeal, on the other hand, are carefully prepared presentations sent out to as few as one or two installations where selected audiences have gathered to watch. These events include special sales meetings, political addresses, medical discussions, and others.

Viewed in this manner, it is not too surprising that the sponsors of many closed-circuit events are looking to hotel ballrooms for their arrangements. In the first place, there is the time factor. In the theatre, the show must go on, as every projectionist knows. This limits the time available for closed-circuit meetings as well as other activities. Meeting rooms in hotels, on the other hand, usually have all day and night available for their use.

Closed-Circuit Efficiency

The nature of closed-circuit TV equipment is still another factor that should be considered. Although the TV projectors available today are quite effective in themselves, they do not compare in performance with the motion picture projectors used in theatres. This fact is most apparent when TV projectors are used to project images on wide CinemaScope screens where spectators are accustomed to seeing large, clear, colorful pictures. Furthermore, most of the closed-circuit equipment manufacturers seem to be concentrating on smaller portable sets which are specifically designed for relatively small concentrated audiences. Because of the smaller pictures produced by these units, it is impractical to use them in large theatres.

We asked Nathan Halpern, president of Theatre Network Television, one of



Principle of the Eidophor optical system can be understood by closely studying the above drawing. The arc lamp at left projects a beam through a condenser to the schlieren lens which is set at a 45-degree angle at the right of the condenser. (The schlieren lens can also be seen in detail at lower right.) Half of the arc beam strikes the mirrored slats of the schlieren lens and the other half passes through the slits where it is absorbed and lost. The light which is deflected by the slats strikes the reflector at bottom. This mirror is coated with an oily substance known as Eidophor liquid. When agitated by the scanning beam of the electron gun shown in the center of the diagram, this oily liquid forms tiny ridges or prisms which alter the reflective pattern of the light in such a way as to form an image. This image passes through the slits of the schlieren lens, then through an objective lens, and strikes another angled mirror before reaching the screen. When the Eidophar liquid is not agitated by an electron beam, there is a complete cutoff of light from the screen. Half is lost at the beginning, as was mentianed above. The other half, unless diverted by ridges ar defarmatians in the surface af the ail, bounces back to the slats ar bars of the schlieren lens and is reflected into the arc lamp fram where it originated.



Man becomes own best friend . . .

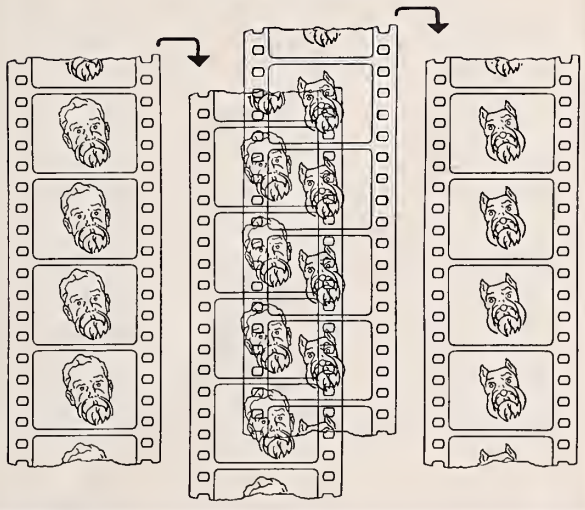
Simple enough, nowadays—even when it's color! For with today's precision equipment, effects such as this are merely a matter of complete co-ordination of production and processing . . . plus over-all expert technical know-how.

Here is the result of constant exploration . . . with finer, more versatile picturemaking the goal.

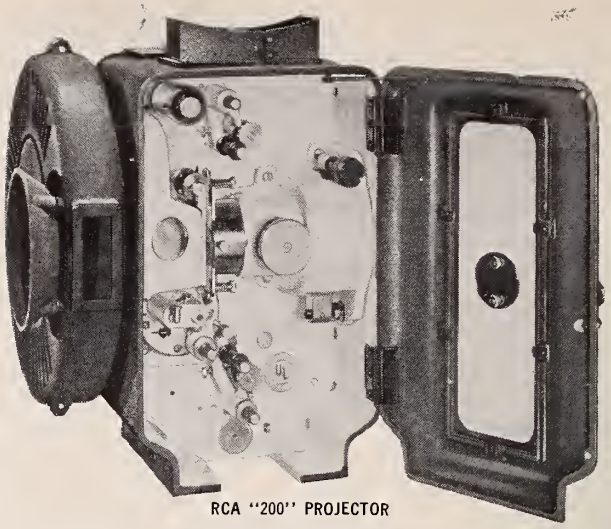
To aid the industry in attaining its ultimate the Eastman Technical Service for Motion Picture Film maintains branches in strategic areas. Inquiries invited.

Address: Motion Picture Film Department
EASTMAN KODAK COMPANY
Rochester 4, N. Y.

There's an
Eastman Motion Picture Film
for every purpose



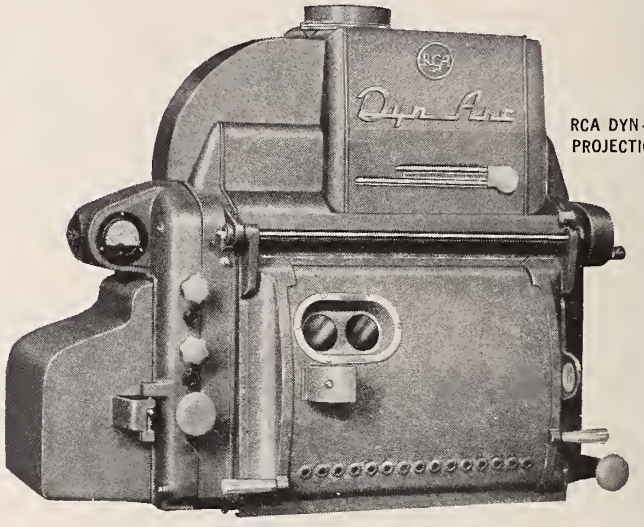
East Coast Division	*Midwest Division*	*West Coast Division*
342 Madison Avenue	137 North Wabash Avenue	6706 Santa Monica Blvd.
New York 17, N. Y.	Chicago 2, Illinois	Hollywood 38, Calif.



RCA "200" PROJECTOR

2

for the show . . sharpest, steadiest show you ever rolled



RCA DYN-ARC
PROJECTION LAMP

(that goes for drive-ins or regular houses!)

There's a clear advantage for you in this great show business team . . . RCA's "200" Projector and RCA's Dyn-Arc Projection Lamp. It's an advantage wise exhibitors recognize right away . . . pictures that stay sharp and clear.

Advance-engineering and precision manufacturing stand back of the rock-steady performance and smooth film travel of an RCA "200" Projector. Automatic loop setting aids easy threading. There's a minimum of moving parts, which means simplified maintenance and quietest operation. 4" lens mount supplied with adapter for Series II lenses.

A reflector-type lamp producing *high-level* light at ⅓ the operating cost of condenser-type lamps . . . that's RCA Dyn-Arc. It's thoroughly efficient with all of today's carbons, technically advanced for lighting needs of the future. High-speed reflector projects maximum light. Complete heat dissipation system keeps operating temperature low. Use Dyn-Arc with *f*1.9 or *f*1.7 lenses for screens up to 145 feet.

Drive-in or indoor . . . patrons come back for more of the quality performances you screen with this stand-out equipment team . . . the RCA "200" and Dyn-Arc. For a pleasant surprise, talk costs with your independent RCA Theatre Supply Dealer. He has the full story ready for you *today!*

the Line that builds Lines at Your Box-Office

RCA THEATRE EQUIPMENT

RCA

THEATRE EQUIPMENT SALES

RADIO CORPORATION of AMERICA

CAMDEN, N.J.

the leaders in the closed-circuit field, what he thought about the situation. On the SMPTE and theatre-TV equipment questions, Halpern had this to say: "The theatre TV committee of the SMPTE discharged its functions in the years gone by, by assisting the industry and formulating engineering standards for the development and manufacture of equipment. The committee has been rather inactive for the past few years, because there has been no new theatre-TV projection equipment manufactured during that time."

Halpern was careful to emphasize the difference between closed-circuit shown in theatres and that shown elsewhere. "A clear distinction should be made," he said, "between theatre-TV and big-screen closed-circuit TV. The latter type of closed circuit on big screen has been growing, but it is not necessarily limited to theatres. Most of its activities have been taking place in hotels and auditoriums and occasionally in theatres."

Although highly optimistic about the future of closed-circuit in general, the TNT prexy said that he did "not look for an increase or decrease in theatre-TV at this time."

It should be pointed out that the growth of closed-circuit, whether confined to or excluded from theatres, will benefit projectionists everywhere. Projectionists are needed to operate the projectors for any showing — in hotels, schools, factories, public auditoriums, hardtop and drive-in theatres, legit theatres, fairs, sports arenas, or wherever. More closed-circuit means more jobs for projectionists.

The Eidophor Projector

Possibly the greatest boom in theatre-TV is still to come. This may occur with the emergence of the Eidophor system, developed by a group of Swiss scientists, notably Dr. F. Fischer and Dr. Edgar Gretener. Eidophor is a descriptive name derived from the Greek, meaning "image bearer." Currently being manufactured by GE for 20th-Fox, it is a new system for projecting live large-screen theatre television in color.

Awaited with much anticipation in the trade, Eidophor has been described by Spyros P. Skouras, president of 20th-Fox, as capable of placing "all the gifted talents of the earth, the peerless artists of every category, within

(*Continued on page* 36)

LETTERS TO THE EDITOR

Kudos from Overseas

To the Editor of IP:

I feel that I must write to you about what we, the projection room staff of the Theatre Royal, Merthyr, England, think of your magazine the *International Projectionist.*

As a subscriber, I await with eagerness for its arrival every month, whence it is immediately opened, read and then taken off to work for the rest of the lads to read.

Your articles are read with the utmost interest, and ideas from many of them have been most helpful in solving our own problems. Not only are they authoritative and excellently printed, but they give us here, in Wales, a general idea of the work of your American projectionists and the problems (and answers) that confront them, which here in our projection room are very often discussed.

So on behalf of the projection room staff here I express our appreciation of your publication, the *International Projectionist.*

G. J. Powell

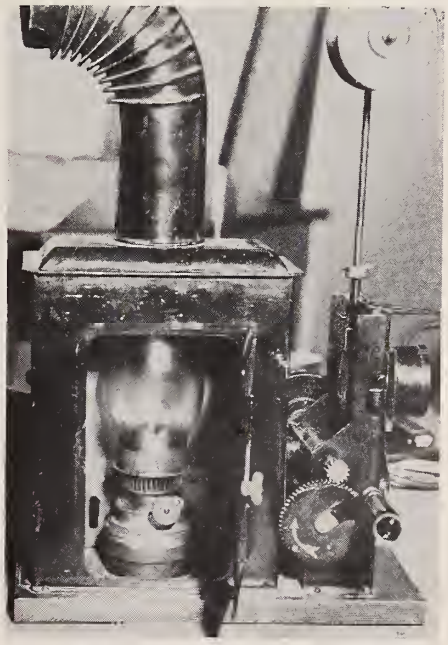
Theatre Royal
Glam, S. Wales, England

Special Lens Needed

To the Editor of IP:

Enclosed you will find a picture of an old film projector for which I am trying to locate an outside lens. When I inquired at several theatre equipment firms, it was suggested that I write to IP for further information.

I would also like to obtain the name of the manufacturer and the date the projector was made. The only clues on the machine itself are the initials "E. P." and the phrase, "Made in Germany." This can be read on a small, round nameplate attached to the outside of the lamphouse door. It is a 35-mm machine, uses kerosene or alcohol for fuel, and has a five-point star drag.



A new lens is sought for this old, oil-burning projector of German manufacture.

Any information furnished by IP or its readers will be very much appreciated.

W. B. Reese

718 Hollywood Ave.
Dallas 8, Texas

Report from the Arctic

To the Editor of IP:

This letter comes to you from the "world's farthest north television station," KFAR, located a little more than 100 miles south of the Arctic Circle. We are justified in this claim by virtue of being approximately 500 feet farther north than the nearest competitive station. The writer will likewise lay claim to being the world's farthest north member of IATSE engaged in TV work. I have been an IA member for many years, having served as business representative for Local 604, Corpus Christi, Texas, and president for one term of Local 407, San Antonio.

Up here we have a very modern RCA-equipped station, an affiliate of both NBC and ABC. Our chain programs are on film, of course, but our "time delay" isn't really so bad. Our broadcasts run from seven to 30 days behind "live" broadcasts in the States. We have good coverage and reception is excellent.

Projection work in TV is very widely separated from theatre projection. You can't realize the extent of this gap unless you are actually engaged in the operation. I am greatly amused in reading some of the controversial discussions anent the relative qualities of the two mediums. Personally, I prefer theatre work. This TV work can indeed be very nerve-racking. I am very pleased that your fine magazine devotes a fair space to TV projection.

It has been a rugged winter here, though not as bad as some past winters. Temperature has ranged from *53 degrees below zero* (Editor's italics) to 36 above. Thus far this season we have had a total of *80 inches of snow* (Editor's italics) with 30 inches of it still on the ground. The sun has been out only a few days all winter. This extreme weather and "ice fog," which occurs when the temperature drops to 35 below, do not in any way affect transmission or reception. We have been on the air for a year now, and have experienced all types of weather including some summer days that almost reached 100 degrees. All in all, our results will match the best the States have to offer and even far exceed some presentations there. We are rather proud of our accomplishments.

I think this will give you a fair picture of local TV conditions up here. Wishing you and your excellent magazine continued success.

Gordon H. Dyer

Fairbanks, Alaska

Modernizing Equipment At Military Theatres In the Far East†

A comprehensive conversion program for the new processes is completed at 120 "fixed" military theatres in the Far East.

By ROBERT A. HAINES

Far East Army & Air Force
Motion Picture Service

THE FAR EAST Army and Air Force Motion Picture Service is a quasi-governmental, self-supporting agency serving military personnel in the Orient. Established in 1946, it provides 35-mm entertainment motion picture service in more than 120 fixed theatres, and services over 650 smaller unit accounts with 16-mm sound projectors and reduction prints of feature and short subjects. To meet the command policy of five program changes weekly, 260 features are required annually, with five 35-mm prints and twelve 16-mm prints of each booking being necessary to satisfy the voracious movie appetite of the military forces in the Far East.

The technological revolution, which bestirred the motion picture industry beginning in late 1952 after the initial success of Cinerama, provided the impetus for a complete and sweeping modernization program in FEAAFMPS 35-mm theatres. All existing equipment was over ten years old, mostly surplus from World War II garrison employment.

Multipurpose Theatres

Careful study, and discussion with numerous industry representatives visiting Tokyo, indicated that modernization planning should be based upon the concept of "more light on larger screens." It also was obvious that new equipment should provide, in addition to best possible performance characteristics, a considerable degree of flexibility with respect to accommodating further industry technical developments still being churned up in the revolution.

Military overseas theatres are normally multipurpose structures serving all needs for group assembly. Average seating capacity is under 500. A few seat upwards of 1000, and the 2600-seat Ernie Pyle Theatre in Tokyo, now reverted to commercial operation, was an outstanding exception to prove the rule.

Permanent-class facilities, properly designed and constructed for theatre use, are extremely few in number, particularly on foreign soil, where American military tenure may be highly indefinite. Design factors such as suitable proportions, good sightlines, satisfactory acoustical conditions, and even adequate ventilation must frequently be de-emphasized in providing *any* sort of needed theatre service.

Other factors, normally insignificant in stateside theatre design, may loom very important in overseas service. Examples are availability of suitable electric power, adaptability of the structures to other military purposes, and availability and turnover rate of qualified projectionist personnel. In the following paragraphs the various factors involved in our modernization planning are discussed in the hope that the information will be useful to other organizations faced with similar problems.

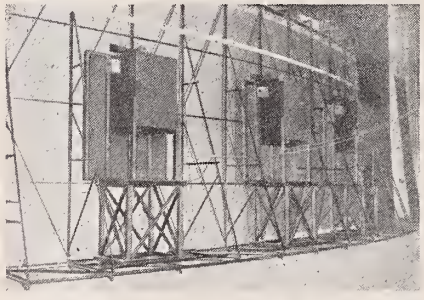


FIG. 1. Rear view of typical mobile screen frame assembly showing platform mounted Ampex type 5050 Reproducer sets. Screen is a 37-foot width Bodde type "B" seamless, with center axis brightness gain factor of 2.9.

The largest practical screen size for each theatre was determined by individual survey. Seamless specular screens were selected to realize high axis brightness and because surveys indicated lateral viewing angles generally to be under 30 degrees. Curved, mobile screen frames were designed to improve light distribution and to allow stage clearance for other activities. Stage loudspeaker systems are mounted within the frames for structural balance and good sound transmission. Figure 1 illustrates the back side of a typical installation.

CinemaScope Accommodated

For reasons to be discussed in connection with sound equipment, screen proportions were chosen to accommodate the 2.35:1 optical CinemaScope aspect ratio. However, in no instance was potential screen height permitted by existing proscenium construction sacrificed merely to achieve the widest possible image. This policy and its corollary, that no image height would be reduced below that previously employed for conventional projection, required comparatively few proscenium alterations.

The desired initial center screen brightness, with 75% side-to-center distribution, was set at 20 foot-lamberts to allow for screen deterioration and less than optimum projector operation and local maintenance. Spot checks with a brightness meter in completed large and small installations indicate that this design goal has been generally achieved.

Projection conditions in military theatres preclude the use of numerous interchangeable optical elements and complex variable screen masking to accommodate the various wide-screen systems. Productions from all studios nevertheless must be run to secure the necessary number of program changes. In the present instance the problem has been satisfactorily solved by using variable-ratio prismatic anamorphosers, and variable-focus projection lens attachments to allow all pictures at a

† Journal of the SMPTE, April 1956.

given installation to be projected to the same height.

These assemblies are readily interchangeable on hook-type brackets affixed to the projector mechanisms. Prime lenses, which remain in place, are selected to produce the standarad image height from the CinemaScope apertures, and to match optical speed of the arc lamps in use. The variable-focus attachments allow the 1.75:1 aperture which was selected as the best compromise for wide-screen projection of nonanamorphic standard prints, also to be imaged at the standard height.

Fortunately, aperture centerlines for the various types of prints closely coincide, so only the apertures, the lens attachments, and the screen draw-curtains need to be changed in going from one type of projection to another. Top and bottom screen roll-off masking, and the draw-curtains are pearl-gray velveteen, which provides some advantages of synchronized screen surround lighting, and is practical from the viewpoint of other military stage uses.

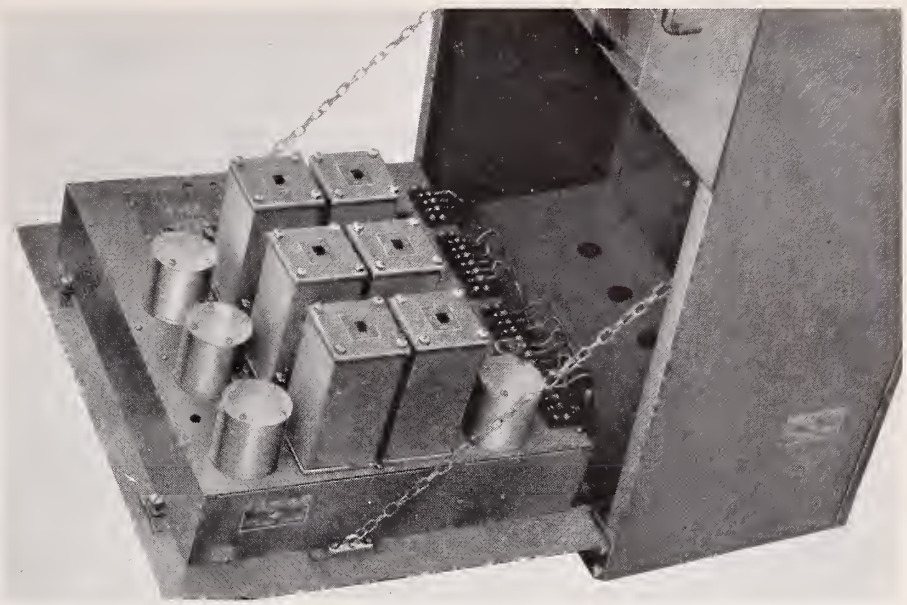


FIG. 3. The AM-8002-B Integrator Panel lowered to service access position shows carrier frequency shift slide switches. Removal of two thumbscrews at front edge of chassis permits reverse turnback of pan for full access to under-chassis components.

Light Sources

Having established the relatively high screen brightness standard previously noted, simple calculations indicated that it could be produced on the selected screens of various widths by only two arclamp types. Simplified high-intensity nonrotating carbon lamps operating at 60 amperes are used for all screens up to 30-feet wide. The same lamps operated at 70 amperes are used for screens in the width range of 30-50 feet. Screens of 37- to 45-feet width are illuminated by rotating positive, angle-trim reflector lamps operating at 90 amperes.

Motor-generator arc power supplies are generally impractical for overseas use, and D.C. mains are nowhere encountered in the Far East. Fortunately, newly developed 6-phase secondary, fullwave selenium arc rectifiers originated in Japan became available in time to be selected for this modernization program. They operate from the 200- to 220-volt, 3-phase power circuits commonly found and deliver rated arc currents with a measured ripple content of only 1.6%. Resulting arc operating is steady and quiet, and flicker in the projected images is negligible in spite of their brightness.

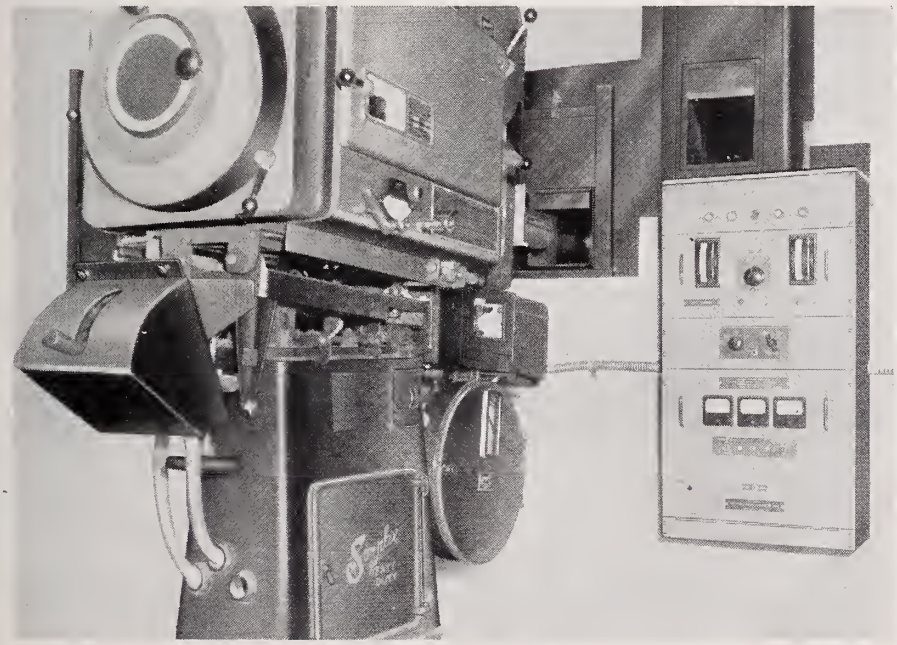


FIG. 2. Typical installation view of PAM-8002-A Perspecta Integrator assembly with pushbutton controller panel. Lefthand assembly comprises Simplex X-L, RCA MI-9030-BC and Strong Mighty "90" on LL-1 heavy-duty pedestal.

Sound Systems

As a basic operational principle, military motion-picture service organizations endeavor to provide the same quality of picture and sound in all situations. Equipment standardization not only conforms to this principle, but also facilitates operation by constantly changing personnel and reduces maintenance costs. Standard commercial projector mechanisms and optical soundheads of recognized quality were therefore selected for all theatres. It long since has been found in military theatre service operations that the best equipment proves also the cheapest in the long run. A typical projector assembly is shown in Fig. 2.

A majority of the 35-mm prints currently available to overseas operations carry either single-channel, or Perspecta directional optical soundtracks. This practice directed the present installation of reproducing equipment only for such soundtracks, but the sensible proviso was kept in mind that sound equipment selected should provide a ready basis for later conver-

(*Continued on page 34*)

MORE LIGHT

MORE

WITH



The Projection Lens with greatest gain in over-all light transmission.

Available for *ALL* lens mounts. Designed to cover *ALL new wide screen techniques!*

ON YOUR SCREEN . . .
MONEY IN YOUR TILL

SUPER-HILUX®!

F:1.0 LIGHT COLLECTING SPEED

3 YEARS RESEARCH, 12 MONTH TESTS PROVE SUPER-HILUX® VASTLY SUPERIOR

Under test in theatres for more than a year, Super-Hilux has proved vastly superior to any other projection lens in: (1) Increase in over-all light transmission *(as much as 30%!)*; (2) Over-all image quality; (3) Flatness of field; (4) Ease of Focusing.

Super-Hilux lenses are designed to project tomorrow's wider release prints including:

- **Paramount Double Frame "Vista Vision"**
- **20th Century-Fox "Cinemascope 55"**
- **"Todd-AO" 70 mm.**
- **"MGM" 65 mm.**

ONE EXAMPLE — AND WE'VE GOT DOZENS!

In a theatre having a 60-foot screen, using a 4″ diameter lens, there was a *gain on the sides of more than 25%* with our 5.50″ Super-Hilux Projection Lens as compared with other "deluxe" models.

If you'd like more proof of Super-Hilux superiority . . . let us arrange a comparison test in your own theatre. Write, wire, phone us or contact your supply dealer. Address Dept. 76.

ASK FOR A DEMONSTRATION OF THE SUPER-HILUX

—World's finest!

PROJECTION OPTICS

PROJECTION OPTICS CO., INC.
Rochester, N. Y. • London, England

Makers of the world famous Hilux Val, Hilux 152, Hilux 264 Anamorphic Lenses.

Roadshow Sound System for "Carousel"

By LORIN D. GRIGNON
Development Engineer
20th Century-Fox Film Corp.

A special six-channel magnetic sound system, making possible great realism in reproduction, has been designed by Fox for the Roxy Theatre in New York and Hollywood's Chinese Theatre.

"CAROUSEL," made with the new CinemaScope 55 process, and the first picture to be produced by this method, was released by 20th Century-Fox simultaneously at the Roxy Theatre, New York, and the Chinese Theatre in Hollywood on February 16, 1956. CinemaScope 55 is a greatly improved version of CinemaScope using 55-mm film. The picture is a musical with some of the best music ever written for a show.

Because of the greatness of the music and the near perfection of the picture quality, it was decided to do the best sound recording and reproduction job that was practicable for the very first run houses much as though these engagements were road shows. The technical story of the sound system for the theatre follows:

Greater Realism Achieved

Four channel stereophonic recording and reproduction does well in recreating a lifelike presentation of sounds in a theatre: it is the best compromise between initial cost, maintenance and complexity. It is well known, however, that the greater the number of channels which are used the more faithfully will the original sounds be reproduced. As a matter of scientific fact, the perfect job can only be achieved by using an infinite number.

To present better sound in the theatre means using the best known kinds of recording and the greatest number of channels that might be feasible. We chose to use magnetic film with six channels, one of which served the surround sounds, or auditorium speakers. At that moment, although the picture was photographed on 55-mm negative, there was no 55-mm release film available, and since it is impossible to put six good magnetic stripes on 35-mm film with enough space left for a good image, it became necessary to use a separate sound film wherever the better system was to be used.

The original recordings were made with six channels, five for loudspeakers behind the screen and one for the surrounds. Thirteen theatres were each equipped with two separate magnetic sound reproducers and two additional loudspeakers behind the screen, along with the added pre- and power amplifiers and switching and control facilities.

Stage Loudspeakers

On the stage, the loudspeakers were placed with one at each side of the screen as far out as possible without blocking the sound from the high frequency horn by the masking or drapes. The other three loudspeakers were located with their centers one-fourth of the screen width apart with one directly on screen center.

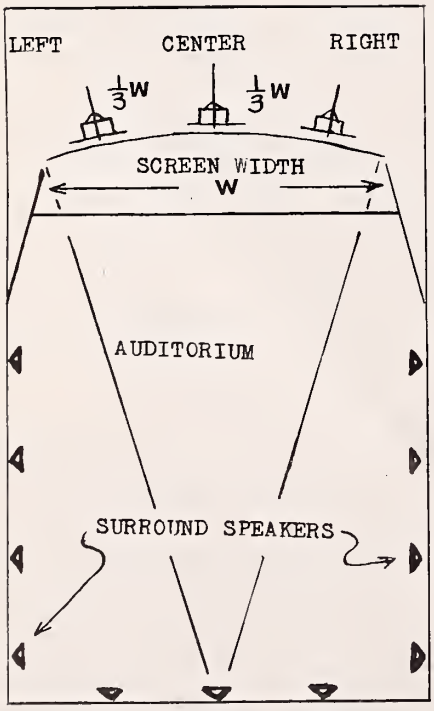
The high frequency horns were pointed straight out towards the rear of the house unless the front seats on the farthest side were not well covered and, in this case, the horns were twisted so as to point more towards the center of the auditorium until all seats were adequately supplied with sound from the high frequency units. A typical arrangement is shown in the figure in which a standard CinemaScope 4-track system is also shown for comparison.

The loudspeakers were phased electrically and acoustically. After this adjustment, the whole loudspeaker position was changed, when necessary, to bring the front of the high frequency horns within six inches of the screen. This latter requirement is frequently assigned too little importance and loudspeakers are often found two to four feet behind the screen causing a distant and reverberant effect in the reproduction.

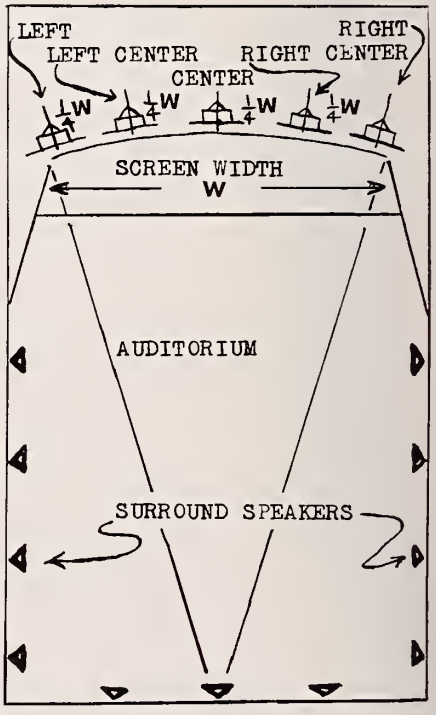
Separate Sound Reproducers

The separate film reproducers were basically equipments which were previously used for some of the 3-D films of three years ago. These were modified for improved film motion to reduce flutter and equipped with 6-track mag-

(Continued on page 35)



Standard 4-channel speaker arrangement for standard CinemaScope.



Six-channel speaker arrangement for "roadshow" version of CinemaScope 55.

In The SPOTLIGHT

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

LAST month we wrote about the worker over 65 in relation to recent union-supported improvements made in Social Security regulations. This month we shall deal with the worker over 45 and the basic facts of his job opportunities and the role Unions play in preserving these opportunities. For the sad fact of it is this: were it not for the strong persuasions of Unions and other interested agencies, the job-seeking employe over 45 would find the going pretty tough. As a matter of fact, the over-45 worker who is not a member of a union does have a hard time of it.

While some progress has been made, there still seems to be an underground of prejudice on the part of many employers against hiring older men and women. This is true despite some very convincing arguments pointing to the fallacy of such an attitude.

Let us for once quote the National Association of Manufacturers, which recently issued a statement declaring ". . . actually the older workers are the cream of the crop."

Most Reliable Workers

Many surveys have been conducted on the comparative job efficiency of the different age groups. Invariably, these have been the results: absenteeism, lateness, and turnover is lower in the older age group than among the younger employes. Morale, loyalty, and general dependability is greater in the older group. In addition, the older worker has been found to be a better master of his trade, is more careful and less prone to accidents. With these qualifications, one would think that employers would seek out older workers instead of advertising, as they often do, for "men *under* 45 . . ."

Although the Department of Labor is making strenuous efforts to combat this situation, it has admitted that "economic old age" begins at 45 years for men, and at 35 for women. This despite the fact that more than one-third of the nation's workers today are past their 45th birthday.

The Forty Plus Club, as well as numerous employment agencies, are very much concerned about this problem. Recently, the head of a leading agency stated "the worst offenders are the large companies in which the 'big brass' leave the hiring of workers to the personnel department. The personnel manager very often will reject the older applicant, despite his qualifications, and the big brass just pretends it doesn't know what is going on."

Labor Unions have made real headway against the unfair discrimination of the older worker. Unions not only broaden the job possibilities for the over-45 worker, but they preserve the right for him to remain on the job. We now have laws barring discrimination against race, creed, and color—some day we may have similar laws barring unfair discrimination against the older worker.

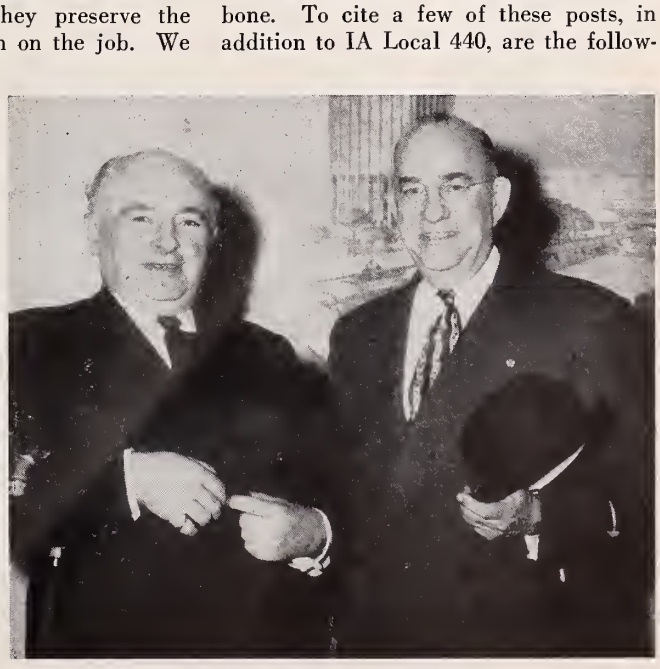
• IA President Richard F. Walsh addressed the convention of the National Association of Theatrical and Kine Employees (NATKE) last month at Edinburgh, Scotland, at the invitation of Sir Thomas O'Brien, M. P., head of that organization. President Walsh also met with NATKE representatives in an effort to help work out solutions to the problems concerning the projection of American films in England, and the exhibition of British films in this country.

• The Hollywood AFL Film Council's nationwide consumer boycott against the feature picture "Daniel Boone," which was made in Mexico by an independent outfit (see IP for March, 1956, p. 20), was successfully concluded when the producer recently signed union shop contracts with Hollywood Locals and agreed not to engage in future "runaway" foreign production. The Film Council voted unanimously to call off the boycott.

The Council's campaign had the support of hundreds of key labor organizations throughout the country and resulted in the postponement of the film's original release date from April to July.

• Adding to the list of honors conferred during the past years upon James A. Whitebone, secretary and business representative for Local 440, St. John, N. B., for 34 years, is his recent election to the post of vice-president of the Maritime Provinces of the newly organized Canadian Labor Congress.

Holding office in various labor and civic organizations is old stuff to Whitebone. To cite a few of these posts, in addition to IA Local 440, are the follow-



With bowler and umbrella in hand, IA President Richard F. Walsh (right) greets England's Sir Tom O'Brien, M. P., general secretary of the National Association of Theatrical and Kine Employees there, at the recent Variety Club convention held at the Waldorf-Astoria Hotel in New York City.

ing: president of St. John Trades and Labor Council from 1926 to 1941, when he resigned to take the post of secretary-treasurer; president, New Brunswick Federation of Labor; in 1938 named a vice-president and now a senior vice-president of the Trades and Labor Congress of Canada; labor representative on the New Brunswick Electric Power Commission; and several four-year terms as a member of the St. John city council. A busy schedule for any one man, we think!

• An agreement between Stagehand Local 12, Albany, N. Y., and Fabian's Mohawk Drive-In Theatre, located on the Albany-Schenectady Road, ended a 19-day strike in which the members of Projectionist Local 324 refused to cross the picket line. When the drive-in reopened this season, the management dropped the stagehand, claiming that there was not sufficient work to warrant employment of a full-time man. A compromise agreement was reached calling for a part-time stagehand to handle the thrice-weekly sign changes.

• The IATSE was chosen bargaining agent for the employes of Byron, Inc., film processing laboratory and studio located in Washington, D. C., at a recent election conducted by the National Labor Relations Board. Included in the balloting were laboratory technicians, film editors, art department employes, cameramen, and other film production technicians.

During the past few years there has been a marked increase in the volume of independent production in Washington, and the campaign at Byron, Inc., was part of an all-out drive by the IA to organize completely film laboratories and studios there.

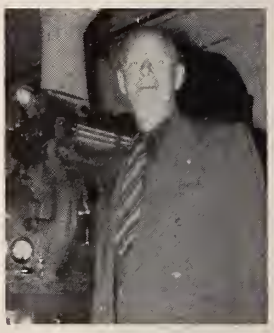
• New York State Association of Motion Picture Projectionists held its 1956 Spring meeting in Binghamton, N. Y., on May 7. George Raaflaub (Syracuse Local 376), president of the Association, presided and Fred Hart (Rochester Local 253) took over the secretarial duties in the absence of Charles F. Wheeler, who was recuperating from a serious automobile accident. The convention delegates and guests were welcomed by Earl Tuttle, business representative of Binghamton Local 396, and were invited to attend a midnight banquet in celebration of the Local's 41st anniversary which followed the closing of the evening convention's session.

Roy Fisher, member of Rochester Local 253 and manufacturer of Ethyloid film cement, gave a brief talk on the proper method of splicing Cronar film. Incidentally, Fisher donated $500 to the Association's entertainment and social fund.

A "Save Copper Drippings Campaign" was proposed by Morris J. Rotker, New York Local 306 and former 25/30 Club president. It was suggested that the proceeds from the sale of the drippings be donated to the Will Rogers Memorial Hospital.

Among the invited guests were Francis P. Hogan, N. Y. State Assistant Industrial Commissioner, who addressed the gathering; Irving Merkur, president of Ace Mfg. Co., maker of the Ace Clear Vision Splicer; James J. Brennan, IA first vice-president, and Paul Ries, National Carbon Company.

• The management of the Palms Theatre in Phoenix, Arizona, recently invited a group of students from the Madison District School there to tour the theatre and get a first-hand picture of how a modern movie theatre is operated. A feature of this tour was a visit to the projection room during show time, which gave the students an opportunity to watch the projection equipment in operation. Dan J. Fisk, projectionist at the theatre, who is also treasurer of Phoenix Local 294, was on hand to answer all questions and was very much impressed with the intelligence of his visitors. "As a result of this visit," said Fisk in a letter to IP,



Dan J. Fisk in the projection room of the Palms Theatre.

"I am confident that should these students be present at a movie when an unavoidable film break occurs or when there is some trouble with the sound, they will be most patient, for they will have a better understanding of the many problems confronting projectionists in their daily work—particularly in theatres having a one-man projection room."

Portal-to-Portal Pay

The Supreme Court recently upheld "portal-to-portal" pay in two cases. One, for butchers who must sharpen knives before reporting for work; and the other for factory workers who have to shower and change their clothing because their work clothes are subject to contamination.



George Raaflaub (secand from right), president of the New York State Association of Matian Picture Projectianists, presiding at the Associatian's Spring meeting held last month in Binghamtan, N. Y. Seated at the table, left to right: Fred Hart, Association secretary pra tem, pinch-hitting for Charles Wheeler who was hospitalized; James J. Brennan, IA first vice-president; Raaflaub, and H. Paul Shay, secretary far District No. 10.

RKO Circuit to Diversify

RKO Theatres, with 83 theatres in operation at the end of 1955, reported a net income of $1,772,500 last year as against $1,059,300 in 1954. Total income was $31,355,300 in 1955 compared to $32,614,800 the preceding year. This decline, said to have been "almost entirely in box office receipts," is attributed "in part to the operation of fewer theatres and in part to the lack of an adequate supply of quality motion pictures."

Although the circuit contains no drive-ins, consideration is being given to certain proposals for their acquisition. Albert A. List, RKO board chairman, also announced broadening of the organization's activities to include textile finishing, electronics research and manufacturing, weaving of synthetic fabrics, and various real estate operations.

Africans Riot at Boxoffice

Violent expressions of discontent are not at all uncommon in present day Africa, so when a movie theatre in the East African city of Kamapala raised the price of admission seven cents, it touched off a riot involving 1000 infuriated movie fans and club-wielding police. Object of the attack was the theatre manager as well as the theatre itself, which suffered broken windows.

Number of Operating Theatres Remains Stable Despite Boxoffice Decline

STATISTICS are funny. A large figure—whether of profits, number of theatres in operation, seating capacity, etc.—may not necessarily indicate prosperity. On the other hand, a smaller figure need not necessarily mean that business is bad. Generally it is wise to compare statistics to get a true picture of what is really going on. Even more productive is a consideration of all the important related facts that are not specifically contained in a particular statistic.

Lately a number of large figures concerning the total of motion picture theatres in operation in the U.S. have been circulating throughout the industry. Though arrived at by varying sources using different methods of counting (or estimating), the figures seem to be close enough to each other to be presumed to be reasonably accurate. Too often, however, a significant fact or two that would give a much clearer picture of the situation has been omitted.

After tallying the results of a recent sales drive to place an MGM picture in every theatre in the world, Metro-Goldwyn-Meyer came up with statistics showing that there were more theatres in operation during the winter of 1956 than in the summer of 1944. The film company declared that the current year's figure of nearly 18.000 would have been larger if the census were taken during the summer when many drive-ins and summer theatres are active.

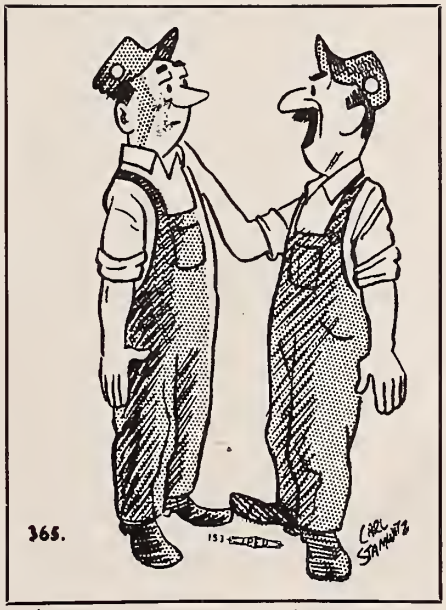
Two other figures on the total number of theatres in the U.S. at the end of 1955 became available recently. Both of these showed approximately 19,000 active theatres, with an estimated 4,600 of these belonging to the outdoor variety. Though slightly higher than the MGM count, it seems fairly safe to accept the larger figure as reasonably accurate.

20,500 Theatres in 1945

Going back 10 years to the end of 1945, we find a total of about 20,500 theatres in the U.S. At this time, however, there were only 100 drive-ins. The '55 figures then represent a drop of 6,000 four-wallers and a climb of 4,500 for the drive-ins. The overall drop of 1,500 theatres since 1945 is relatively insignificant in view of the fact that just two years ago at the end of 1953 there were 18,000 theatres, or 1,000 less than in '55. As a matter of fact, the number of theatres in each year during this ten-year period, 1945-55, shows an unusual stability, ranging between 20,500 and 18,000 throughout. For comparison, 20 years ago in 1935, there were just 15,000 theatres.

Interesting as these figures are, their real importance can only be measured in the light of other closely related phenomena. Designating each theatre as an equal unit is all right for some purposes, but it should be remembered that the size of theatres varies greatly. A four-waller with 500 seats is not quite the same thing as a 2,000-car drive-in. If we estimate 2½ patrons per car, then the drive-in has ten times the seating capacity of the four-waller. This only goes to prove that counting marquees alone gives us a partial glimpse of the picture. The trend in drive-ins today, incidentally, is toward the giant deluxe 2,000-plus car variety.

Other factors should be considered as well, such as gross receipts, attendance, advertising budgets, fluctuations in the value of the dollar, the amount and quality of releases, subsidiary incomes (concessions, etc.), and many more. In addition, an extensive analysis should always be made when a radical change is encountered. For example, the total number of releases fell sharply from 533 in 1942 to 127 in 1943. Well, there was a war on then and the depletion of Hollywood's manpower, money power and film stockpile took its toll on new pictures. Latest figures show that there were a total of 392 releases in 1955.



Courtesy, AFL-CIO

"Glad to see you at the union meeting last night, Carl. Is your mother-in-law visiting you—or is your TV set haywire?"

A study of admission prices clearly reveals the general inflationary trend since World War II. In 1945, the average U.S. theatre admission cost was estimated at 29 cents plus 6 cents tax, while last year it was nearly 50 cents, without tax. Tax relief for theatres was granted in 1954.

The Inflation Factor

The estimated motion picture theatre gross in 1955 was the same as that in 1944—$1,185,000,000. The all-time high was in 1947, when the gross reached $1,565,000.000. The modern low was established in 1953 with $1,007,500,000.

A very important item often omitted in discussions on the number of theatres and seating capacities is the question: how many of those seats actually get sat in? Weekly attendance figures in the U.S. show a gradual decline from the high years of 1946-48 when 90 million people went to the movies each year, to 60 million in 1950, 50 million in '54 and 46 million last year.

All in all, things aren't as bad as a lot of people are saying, nor are they as good as they once were. Theatre attendance has taken a big drop, but theatres themselves are carrying on with relatively few dropping out. Contrary to beliefs, there are new four-wallers being built and the growth of deluxe drive-ins is certainly a healthy sign. The recent technological advances have put new life into the industry as well as some pressure on the TV networks with their contrasting dimmed out window-pane size screens.

Big Paramount Investment

With $50,000,000 invested in new motion pictures, Paramount Pictures Corp. is setting its sights on the highest two-year gross in its history. Eighteen new films are scheduled for release this year and about the same number in 1957. Among the '56 releases is Cecil B. DeMille's "The Ten Commandments," which at $12,000,000 is said to be the most expensive picture ever made. All of Paramount's productions will be in VistaVision with many of them in Technicolor.

Legit Theatre Shortage

The impression that television is drawing away huge crowds from other entertainment media—an idea wildly publicized by the TV folk themselves—is to be seriously questioned in the light of the current situation on Broadway, New York, where new legitimate productions are finding it as hard to locate theatres as theatre-goers are to locate tickets for some shows. The sudden shortage of legit theatre playhouses is especially acute in regard to those auditoriums that usually accommodate musical comedies.

Brushup on Fundamentals

A monthly department devoted to questions and answers on technical subjects that affect the projection craft.

How is static electricity generated?

Here is what really takes place. When you run the comb through your hair, the friction between comb and hair results in a loss of electrons by the hair and a gain of electrons by the comb. The hair is then left with a positive charge and the comb with an excess of electrons or negatively charged.

You might wonder why the opposite did not take place. When some objects are rubbed against others they will always assume either a positive or a negative charge. For example, a hard rubber comb will always become negatively charged when rubbed against hair or flannel. On the other hand, if a glass

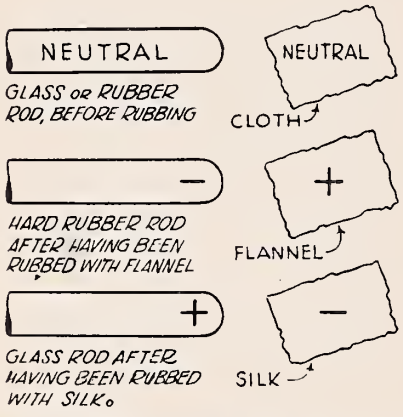


FIG. 2. Before rubbing, both rod and cloth are neutral. When the rubber rod is rubbed against the flannel it gains electrons and becomes negatively charged, while the flannel loses electrons and becomes positively charged.

rod is rubbed against a piece of silk, the act of rubbing will tear away a number of electrons from the atoms that make up the glass rod, leaving the rod with a positive charge. What happened to the electrons? The silk gained these electrons and is, therefore, negatively charged. The two conditions just mentioned are illustrated in Fig. 2.

We mentioned that if a charged comb were held near a piece of paper, the paper would be attracted to the comb. This leads to a basic law of electronics—a negatively charged body will induce a positive charge in a neutral body near it, and conversely, a positively charged body will induce a negative charge in a neutral body near it. (See Fig. 3)

When the negatively charged comb was brought near a piece of neutral paper, a positive charge was induced on the paper. The paper was then attracted to the comb. Since the comb was negative and the paper positive, and since

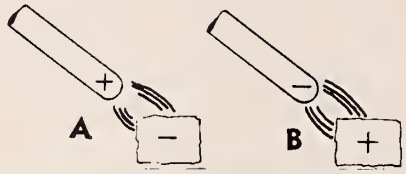


FIG. 3. A and B originally were neutral. When a positively charged body was brought near A, it induced a negative charge on A. Part B shows that the opposite also is true.

attraction took place between them, we may safely assume that a positive charge will attract a negative charge. The opposite also must be true. In general, we can say that *unlike charges will attract each other.*

How do similar charges affect one another?

What effect would one negative charge have upon another? You probably guessed the answer—they would repel. A positive charge would also repel another positive charge, leading to the next important rule—*like charges will repel each other.* Our entire concept of electricity depends upon these two laws. Reference to Fig. 4 will further clarify their meaning.

Figure 5 shows how charges are distributed on an irregularly shaped body. These charges create electrostatic lines of force which are assumed to originate on a positive charge and terminate on a negative charge. When these charged bodies are close to each other a spark will jump from one body to the other

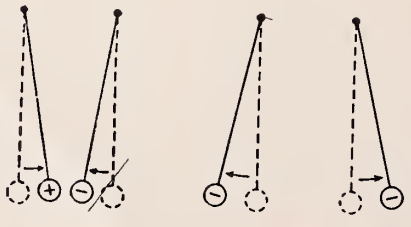


FIG. 4. The dotted lines represent the original position of two pith balls. When these pith balls are charged with like charges they will repel each other. If their charges are of opposite polarity they will attract each other.

and the charges will be neutralized, leaving both bodies without any charge, that is, neutral.

Figure 6 illustrates the distribution

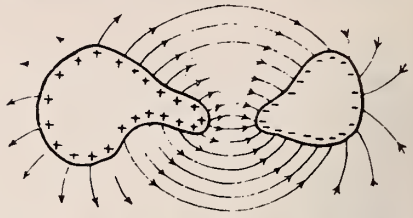


FIG. 5. This diagram illustrates the distribution of electro-static lines or charges on an irregularly shaped body.

of electrostatic lines of force first between two parallel plates, and then between a plate and a sharply pointed body. Notice the heavy concentration of lines of force on a pointed body—all charges concentrate at a point. Because of this fact sharp points are avoided on all high-voltage apparatus, since a heavy concentration of charges will result in a breakdown of insulation.

This is especially true on transformers where extra insulation is used at all sharp points. Lightning rods are purposely pointed for this same reason. It is desirable to have this concentration in a lightning rod. In practice the rod is mounted on a roof for protection from electrical storms. When lightning strikes

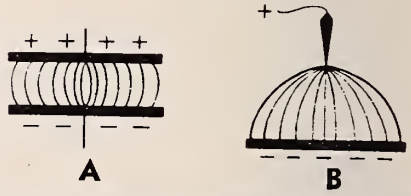


FIG. 6. A illustrates the distribution of charges on a parallel plate condenser, and B shows the heavy concentration of charges at a sharp point.

near a building it is attracted to the pointed rod. It strikes the rod, but the rod is grounded to a water pipe, and the charges are safely conducted to ground where they are rendered harmless.

How does dynamic or moving electricity differ from the static kind?

So far we have been concerned only with static electricity. Let us now consider dynamic or moving electricity. Whenever different charges are present between two points an electrical pressure will also appear between these two points. We call this pressure by many different names as potential differences, electrical pressure, voltage, and electromotive force. The most common name is voltage. This voltage causes a drift of electrons from negative to positive,

and we say that electrons flow *from minus to plus.*

A flow of electrons constitutes an electric current. Perhaps you have been told

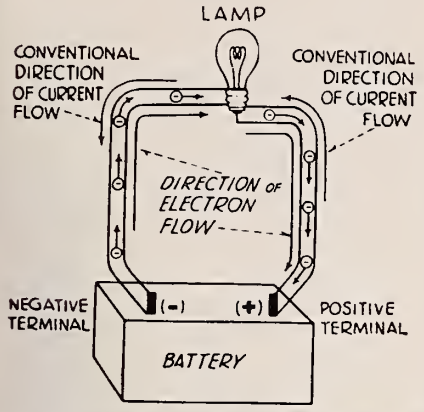


FIG. 7. Diagram showing that electrons flow from minus to plus.

that current flows from plus to minus. This was once believed to be the case. As brought out here, the opposite is true. Current flows from minus to plus. Fig. 7 illustrates both theories.

What makes current flow through a wire?

Up to now we have been concerned mainly with electricity at rest, that is, static electricity. For practical purposes, however, electricity in motion commands our greatest attention. Electricity in motion—*dynamic electricity*—exists when electrons are forced to leave their atoms and move on to neighboring atoms. Such a drift or movement of electrons through a conductor constitutes a flow of electric current.

Everyone knows that a train or an automobile cannot move unless fuel in some form is consumed in the process of locomotion. When we turn on the water faucet in the sink we rarely stop to reason why the water flows; we just take it for granted. The reason that the water flows through the faucet is because large pumps at a central pumping station work day and night to maintain the service. These pumps provide the pressure necessary to force the water through the pipes. In a steam type locomotive, the burning of coal in a boiler heats water and changes it to steam, thus providing the pressure that pushes a piston and thereby turns the wheels. In an automobile it is the explosion of gasoline mixed with air.

Thus we learn that whenever it becomes necessary to move anything through space a force or pressure must be applied to the object which is to be moved. If we are to have a flow of current in a wire, the electrons in that wire must be set into motion so that they can flow through the circuit. Where can we obtain the pressure which will move electrons through wire? The answer lies in the battery, generator, photocell, thermo-couple, and piezo electric devices. All of these are sources of electrical pressure.

Why are some materials conductors, others insulators?

We have learned that all types of matter contain atoms and electrons. The amount and spacing of these electrons and atoms determines physical and electrical characteristics of matter. For instance, wood and iron look and behave the way that they do because of the number and arrangement of their electrons and atoms. In some materials the electrons are very loosely held to the atom. When a voltage is impressed across such material the electrical pressure causes a large number of electrons to flow in the electrical circuit. These are called "free electrons" and are the ones which originally were furthest removed from their atoms, that is, the outer electrons shown in Fig. 1 of this series in last month's issue.

Materials having a large number of these free electrons are called good conductors of electricity. Most metals are good conductors, as also are acid or salt solutions. Materials having practically none of these free electrons are called insulators. Some insulators used in radio are wood, hard rubber, bakelite, glass, ceramics, plastics, silk, cotton, and many other non-metallic materials. Insulators sometimes become conductors when subjected to extreme heat, or to high frequency currents. Some materials are neither good insulators nor good conductors. These materials are called resistors and have many uses in radio circuits.

Boxoffice Patterns Traced Over Past 10 Years

Philadelphia researcher Albert Sindlinger, who not long ago released figures to the film industry showing that the TV-ing of film clips from forthcoming motion pictures was having an adverse effect on theatre attendance (see *Spotlight* page, April *IP*), has now analyzed the modern film market even further and has come up with what he terms "eight historical cycles" that have taken place during the past ten years. Sindlinger's chronological analysis of the situation is as follows:

(1) 1947-48—motion pictures an important source of inexpensive entertainment; competition from other media relatively insignificant.

(2) 1948-49—expansion of TV with an accompanying decline of theatre attendance.

(3) 1951—subscription TV tested in Chicago; public indicating receptivity to the idea.

(4) 1952—40% of the nation without access to TV; theatre boxoffice fall-off attributed to poor pictures and general economics. However, in non-TV areas theatre attendance was higher than in 1948.

(5) 1953—new stations make TV more widely available, with theatre attendance starting to decline in these new areas. In the old TV areas, on the other hand, theatre attendance picked up.

(6) 1954—technological changes in motion pictures put new life into the industry; admission tax relief also a factor.

(7) 1954-55—the first increase in theatre gross and net for a 12-month period since 1946.

(8) final quarter 1955—decline at boxoffices seen due to Hollywood TV programs using film clips.

Whatever else Sindlinger's report proves or does not prove, it does seem to clearly indicate that as the novelty of television wears off, the public will divide its attentions more evenly between motion pictures and TV, using quality as its guide. Another conclusion we can arrive at is that the recent technological revolution experienced in the motion picture field has definitely helped boxoffice receipts. And finally, that Hollywood had best be very wary of any promotion method that openly discloses its product via a rival medium.

National's New 10-mm Carbon Boosts Light Output

The National Carbon Co. has announced a new 10-mm x 20-inch high intensity carbon for use in motion picture projection that is reported to give up to 11% more light. In addition to producing a whiter light, this new National positive carbon is said to burn with greater arc stability and have a larger crater diameter.

The 11% increase in light efficiency can be obtained at the recommended operation level of 95 to 110 amperes. The carbon has the further advantage of burning considerably slower than previous kinds, with measurement showing a 15 to 20% decrease in burning speed at the 95- to 100-ampere range.

According to National, field tests using the new carbon were conducted in all types of projector equipment throughout the country with results showing greater screen light at lower cost. This was found to be true of large screens in both indoor and drive-in theatres.

Careful Maintenance Is Key to Quality Drive-In Projection

A clean projector gives the steadiest image. Customers will not revenge themselves against speakers that work.

By E. J. NELSON
The Ballantyne Company

THE NEW techniques and bigger screens introduced during the past few years make necessary great skill and constant attention on the part of the projectionist.

As an example, the average theatre formerly projected a picture about 18 feet wide. This figure represented a magnification factor of approximately 262 times, which means that a film fluctuation of 1/1000th of an inch would show up on the screen as movement of .026 inch, an amount not perceptible to the eye. But, by today's standards. the average screen is roughly 35 feet wide. As a result, the magnification factor has been increased to 509, which means that an error of 1/1000th of an inch now appears on the screen as an half-inch movement. This amount is easily perceptible to the audience.

An astounding amount of image movement is possible on a drive-in screen when you consider that many screens are now 100 feet in width, making the magnification factor 1,454 times.

Beware of Dirt

The number one enemy of good projection is dirt. Today every projection room must be maintained much more carefully than ever before. Furthermore, once your equipment is allowed to be encrusted with dirt, cleaning it becomes a complicated and annoying job.

Simple steps with simple tools, taken regularly every day, will keep your projection equipment spotless and considerably increase its life. Cleaning and oiling time can be but a matter of a few minutes when done regularly.

Following are some suggested points to remember when cleaning and oiling projection equipment:

1. Blow lint and dust from lateral guide rollers and fire valve roller daily.

2. Use small paint brush to clean the film side of the projector and soundheads every performance.

3. Brush all the sprockets and pad roller at least once every performance with a stiff typewriter brush or tooth brush, brushing around the roller grooves as well as across all sprocket teeth.

4. Oil the side of the projector with an eye dropper. One drop of oil every few days is sufficient for oiling film side of projectors and soundheads.

5. Wipe off all excess oil regularly. Excess oil gathers dust and soon becomes an abrasive rather than a lubricant.

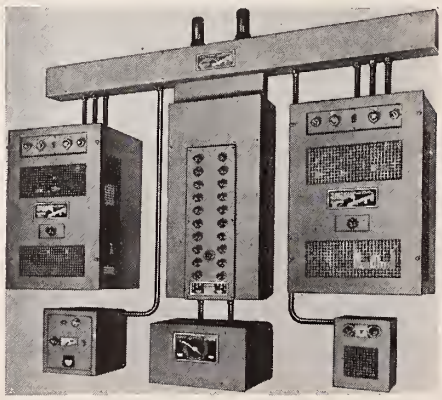
6. Wipe film tray and gate at least twice a performance. It is important to keep the film path spotlessly clean.

7. Never clean a projector while it is running.

It has been proven that vandalism of drive-in speakers will run in direct proportion to the amount of field maintenance. When a customer is forced to listen to a defective or rattling speaker his reaction is very often, "I'll fix it so they will *have* to repair it."

Ease of maintenance, coupled with excellent sound quality, and simplicity of assembly, are the foundation of the design used in Ballantyne's Dub'l cone speaker. Replacement of cones is so simple that it takes only a few minutes time.

In order to replace the cone simply open the case by removing three screws. Then remove the damaged cone, drop in a new one and close the case. There is no need for alignment or thickness gauges as each part fits into its place and the speaker mounts on alignment pins.



Ballantyne amplification systems such as the MX model shown above are designed exclusively for drive-ins and cannot be used in conventional theatres. With this sound system all ramps are wired to ramp switches. Each switch has three positions, "on", "off", and "test". When off, load resistors are automatically connected to balance the field load. A field short is isolated by throwing each ramp into test position. Any short will cause a surge in volume over the monitor speaker.

Guide for Drive-In Builders

A guide to drive-in planning entitled "Let's Build a Drive-In" is available from National Theatre Supply. Including information on every major aspect of drive-in planning from selecting the site through choosing equipment, this booklet includes many explanatory diagrams, typical drive-in layouts, and operational statistics.

Some of the areas covered by the booklet include: pitfalls to avoid in site selection, pre-determining the proper car capacity, design of entrance and exit roadway system, comparison of single-ramp and double-ramp layouts, proper car spacing and speaker locations, surfacing materials and drainage allowances, calculating the size and angle of the screen tower with regard to projection room location, landscaping and fencing, selection of attraction boards, location and design of the boxoffice, layout suggestions for concessions, locations of playground facilities and location and operation of projection room.

Altec-GPL Pact for TV Service

General Precision Laboratory, Inc., of Pleasantville, N. Y., has arranged with the Altec Service Corp. to provide a nationwide, franchised service for its industrial TV equipment. With two hundred field engineers and thirty branch offices and stock points strategically located from coast to coast, Altec will supply routine maintenance and parts for GPL's closed circuit TV products. The new arrangement will permit purchasers of GPL equipment to contract for regular service and prompt parts replacement anywhere in the country by trained technicians.

Indie TV Station Goes Color

To WITI-TV in Milwaukee, Wis., goes the distinction of being the first independent television station in America to telecast all of its live studio programs in color. The station started operations a few weeks ago using the new Du Mont Vitascan method for live color pick-up.

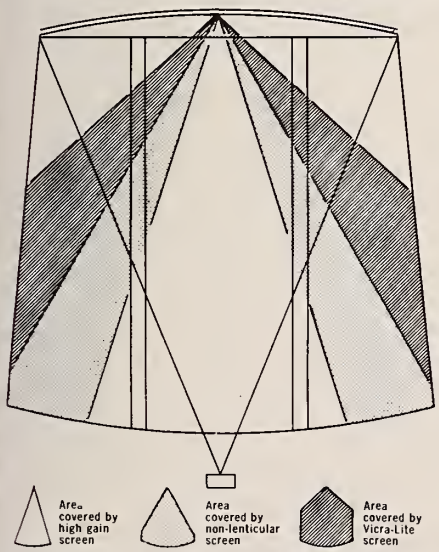
New Products for the Industry

AN ALL-VINYL LENTICULAR SCREEN, which is claimed to provide all the benefits of lenticulation in controlling the distribution light without the disturbing presence of visible seams, is now being manufactured by L. E. Carpenter & Co., Empire State Bldg., New York City. The screen is available through theatre equipment dealers under the trade name, Vicra-Lite.

As a lenticular screen, its surface is embossed with thousands of tiny, scientifically-designed indentations, or lenticules, which control the distribution of light so that visibility from the side seats of a wide theatre can be as satisfactory as from seats in the center. This wide pattern of light distribution occurs even though the screen has a high-gain aluminum reflecting surface. The screen is produced in two different lenticular reflecting patterns, one for theatres with head-on projection, and the other for houses with a projection angle of 10 degrees or more.

The seams of the Vicra-Lite screen are joined by a patented process known as "Nicro-Weld" which is said to produce a completely flat seam that cannot be detected by the audience. The all-vinyl construction of the screen is claimed to make it extremely durable and resistant to damage that might occur during handling or cleaning.

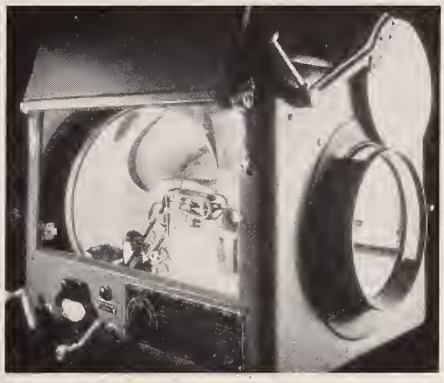
The L. E. Carpenter Co., which produces the Vicra-Lite screen is a 30-year



Typical seating plan showing comparison of optimum light distribution of non-lenticular, high-grain, and Vicra-lite screens.

veteran in the plastics field, and also manufactures vinyl fabrics for a variety of applications outside the theatres. It has produced motion picture screens marketed under other trade names for about 20 years. Final work in turning the Vicra-Lite material into finished screens is done by the Hurley Screen Co., also of New York.

A VERSATILE ARC LAMP designed to project a spot at the aperture which is of the correct size to meet the requirements for 55-mm, 65-mm, and other large-frame prints has been announced by the Strong



Strong's new lamp for wide film.

Electric Corp. of Toledo, Ohio.

The lamp is equipped to burn 13.6-mm carbons, and embodies a higher magnification. There is a larger opening in the nose to pass wider beams of light to the aperture, and a larger dowser. The only material change required to use the lamp for 35-mm projection is the quick substitution of a lower-magnification mirror.

TWO NEW SELENIUM RECTIFIERS for high-current use have been marketed by the Kneisley Electric Co., Toledo, Ohio. A new 135-ampere, single-phase unit is available for application in rural areas where three-phase power is not readily available. A 180-ampere, 3-phase rectifier is available for use in connection with new arc lamps employing 13.6-mm rotating carbon trims.

Both units feature down draft ventilating fan systems and rotary tap switch current adjustment on the front panel. Transformer mass is in the base of the unit. A four-blade, silent ball bearing fan located above the transformers is said to exhaust 1500 cubic feet of air per minute. The selenium stack is located at the top, permitting easy cleaning. All terminals are also located at the top.

Witnesses at Senate Hearings Denounce Toll TV

The recent Senate hearings in Washington on toll TV—which incidentally were not televised—brought in numerous interesting people with numerous interesting arguments both for and against the pay-as-you-see idea. By far the most formidable group both in numbers and persuasion was comprised of those against the idea. The general feeling in Washington at the close of the hearings was that the senators of the Interstate Commerce Committee, the agency conducting the hearings, would compile a report unfavorable to toll TV. It was further felt that whichever way the report does go, it probably will not be ready for many months, possibly not until 1957.

Some of the witnesses who testified at the hearings are listed below, along with pertinent excerpts of their testimony:

Injury to Theatres

Andrew J. Biemiller, AFL-CIO representative—"The advent of toll television would undoubtedly deal a further blow at the already hard-hit independent community movie theatres throughout the country." Quoting a resolution adopted at the first annual convention of the AFL-CIO, Biemiller decried pay TV as "an infringement on the property right of the general public and an intrusion into the privacy of the home which would curtail free use of a medium which has become a part of the home."

Mort Farr, board chairman of National Appliance and Radio-TV Dealers — "Under the present system of American TV, no set owner is deprived of a program because he is not as prosperous as his neighbor, but once the turnstile is placed in his living room, the families who rely most on TV entertainment and information would be hit the hardest because they are the ones who for economic reasons would have to restrict their viewing most. Television no longer would belong to all the people all the time."

Richard S. Salant, vice-president of CBS—Salant compared toll TV to "a coin attachment on public water fountains during a hot day in July, so that it would cost a nickel to get a glass of water. For the first time, the wealthy or extravagant family will see programs which the average American family will not be able to see. In free TV there are no second-class citizens; in pay TV there will be. The Government would be breaking faith."

Dr. Frank M. Stanton, CBS, and Wilton D. Radford of New York City, who testified as one of the millions of TV set owners in the U.S.—"It would highjack the American public into paying for the privilege of looking at its own television sets. This is a betrayal of 34 million families who have already

(*Continued on page* 33)

Westrex Marketing New Sound Equipment

A new improved line of sound reproducing equipment designed to meet the needs of recent technical developments in the motion picture industry has been announced by Westrex Corp., New York. Equipment includes complete multi-channel and single channel sound systems for both magnetic and optical reproduction. These latest Westrex sound systems are reportedly simpler, smaller in size, and from 5% to 30% cheaper than comparable 1955 equipment.

The Westrex Standard single channel sound systems make use of the new major components employed in the standard multi-channel sound systems and have been developed specifically for theatres not ready to convert to stereophonic sound. Provision is made for future expansion to multi-channel reproduction.

Fits All Projectors

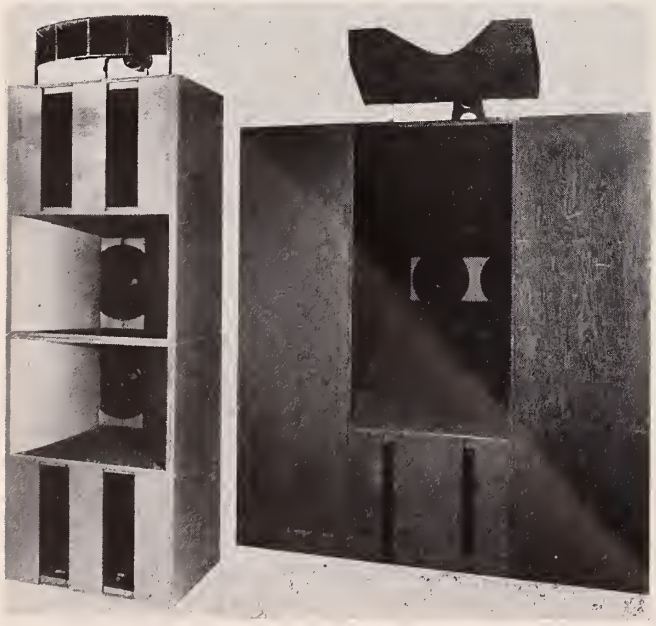
The new Westrex Standard R10 stereophonic magnetic reproducer is said to fit any modern projector. This penthouse unit consists of two impedance drums, an adjustable idler roller, a 32-tooth sprocket and a replaceable 4-track magnetic reproducer. The R10 is a film pulled reproducing mechanism which does not require any additional motor power.

The model R6 optical sound reproducer operates noiselessly and features special timing belts which do not stretch or slip. The unit also has a long optical path and a device that equally diffuses the light to insure good reproduction from either variable area or density sound tracks. All shafts are mounted in ball bearings.

The 51B multi-channel magnetic preamplifier cabinet is wall mounted and contains up to four pre-amplifiers, control amplifier, low pass filter, changeover and muting relays for multi-channel magnetic reproduction. The amplifiers are of the plug-in type and are easily removable for servicing. Individual gain controls and equalizers are provided for balancing the three main channels.

The 52A multi-channel control cabinet is also wall mounted and contains the control equipment for single and multi-channel as well as non-synchronous and emergency operation. Three gang volume control is provided for the backstage channels and a single control for the auditorium surround channel. In addition, the cabinet houses the regular emergency photoelectric cell amplifiers and selector switch for non-sychronous photographic and multi-channel magnetic or optical operation. All of these connections are accessible from the front.

Other units in Westrex's improved line of sound reproducing equipment are standard multi-channel cabinets with up to four 26 type 30-watt amplifiers, the 48A single channel control cabinet, the 47 type single channel transmission cabinet (20-inch high), and new loudspeaker assemblies with improved high and low frequency units and multi-cellular horns.



Two speaker assemblies from the new Westrex line of theatre sound equipment. At left is the Westrex Standard 15 Type loudspeaker assembly with 80-degree multicellular high frequency unit. At right is the 16 Type assembly with 80-degree high-frequency "acoustic lens." The acoustic lens is said to assure even distribution of sound throughout the theatre with a minimum of interference patterns.

PERSONAL NOTES

WILLIAM J. SWEET has been appointed Du Pont's motion picture technical representative for New York City. With Du Pont since 1950, Sweet held the position of motion picture finishing area supervisor at the Parlin, N. J. photo products plant. Prior to that, he was technical representative in the Dallas district. He succeeds VICTOR M. SALTER, who has been named trade and industrial products supervisor for the New York district. Salter joined Du Pont in 1947 as a physicist in the photo products research division. He became a motion picture technical representative in 1953. A member of the SMPTE and ASC, Salter replaces WILLIAM J. CANNON, who has been transferred to the Boston district as sales supervisor of all photographic products. Cannon has been with Du Pont since 1938, beginning as an X-ray salesman in the New York area. In 1948 he was appointed trade products supervisor of that district.

* * *

THOMAS J. MULROY has been appointed sales manager of the new Vicra-Lite screen division of L. E. Carpenter & Co. Formerly with Bausch & Lomb, where he was product supervisor in charge of sales of CinemaScope attachments and projection lenses, Mulroy will have his new headquarters in the Empire State Building in New York City.



Thomas J. Mulroy

* * *

GEORGE T. EATON has been named head of the photographic chemistry department of Kodak Research Laboratories. Eaton joined Kodak in 1937 as a research chemist. Since that time he has risen steadily to supervisor of the industrial sales laboratory and then to technical staff assistant in the applied photography division. In 1943 he was a joint recipient, along with John I. Crabtree and L. E. Muehler, of the Journal Award of the Society of Motion Picture and Television Engineers for a technical paper on the removal of hypo and silver salts from photographic materials. In taking over his new position, Eaton replaced Crabtree, who is retiring.

* * *

ROBERT M. DUNN has been appointed general sales manager of Ansco. A member of the firm since 1931, Dunn has been assistant sales manager for the past five years. In his new capacity, he will be responsible for the marketing of all of Ansco's photographic products and for the formulation of sales policies.

BOOK REVIEWS

TRANSISTORS I, published by RCA Laboratories, Princeton, N. J., 676 *pages*, $4.50.

Transistors I is a collection of scientific and enginecring papers covering a good portion of the research recently conducted in this fascinating branch of the electronics field. Most of the reports contained in the book originated in RCA laboratories; however, for the sake of a more rounded picture, a number of "outside" articles are also included. Taken together, the selections provide a very comprehensive and highly technical view of the transistor movement today. Projectionists with more than a smattering of the technical end of transistors will find it very interesting, as transistors are beginning to invade the movie industry. It should be noted that the word "transistors" as used in the title is intended to include semiconductor diodes. From the title also, *Transistors I*, we may surmise that RCA has a *Transitors II* somewhere up its electronic sleeve.

ELECTRONIC ENGINEERING, by Samuel Seely, McGraw-Hill Book Co., 525 *pages*, $8.

Here is a detailed discussion of a large variety of electronic circuits beginning with a general introduction to tubes and tube circuit principles, and then proceeding to a complete consideration of the more important electron tube circuits. Emphasis throughout is placed on the physical and mathematical analyses of the circuits. In addition to explaining the techniques of analysis in relation to the special features of the many circuits examined, the book offers the means for combining circuits of different types in order to achieve required operational results.

Among the more interesting chapters for projectionists are: Characteristics of Electron Tubes, Basic Amplifier Principles, Oscillators, Special Sweep Generators, Rectifiers, Rectifier Filters and Regulators, and Transistors as Circuit Elements.

RKO Profits Rise

Net income of RKO Theatres Corp. for 1955, including special items, has been reported at $1,976,200, an increase of $1,146,249 over the 1954 net. The special items consisted of gains and losses from the disposal of theatres, a net loss on the cancellation of a lease and an increase in the reserve for taxes and contingencies. Net income before special items for 1955 was $2,153,900, compared with $1,704,100 in 1954.



. . . the SUPER SNAPLITE LENS for the clearest, sharpest, brightest pictures you have ever seen on your screen!

Your patrons will notice the difference — Super Snaplite gives greater contrast, better definition, more light on the screen where it really counts.

Ask your dealer for Bulletin 222.

KOLLMORGEN Optical CORPORATION

Plant: Northampton, Massachusetts
New York Office: 30 Church Street, New York 7, N. Y.

Hilux Long-Throw Anamorphic

Projection Optics Co. has produced a special adaptation to permit the use of the Hilux-Val as a reversed anamorphic projection lens. The adaptation is particularly convenient for drive-in theatres that require a focal length more than seven inches. The inversed Hilux-Val unit can be used with any standard projection lens.



Projection Optics, Rochester, N. Y., has marketed a 16-mm anamorphic projection lens for the showing of small-gauge CinemaScope prints. It is a combination of an *f*/1.6 prime projection lens, an anamorphic, and a variable focusing mount. Entirely encased in a single lightweight aluminum housing, the unit sells for $119.

Faster Vidoscope Lenses

Two new groups of ultra-fast projection lenses of standard barrel are now available through the Walter Futter-Vidoscope organization, 730 Fifth Ave., N. Y. Designed and manufactured by the well-known firm of Pierre Angenieux, the lenses can be obtained in the speed of *f*/1.4 in many focal lengths.

One of the groups, known as the Vidoscope-Angenieux Series 86, includes lenses of from four to seven inches in focal length in steps of 2/10ths of an inch. An unusual feature of these lenses allows the focal length of each lens in the group to be adjusted within an area of 0.2 inch. This is accomplished by means of a knurled adjusting ring and calibrated scale on the barrel of the lens. As a result, it is possible to obtain a screen image of exactly the size required to fill a particular screen.

The other addition to the Walter Futter line is another group of fast lenses also rated at *f*/1.4 and in focal lengths of 2.5 and 3 inches. This series, known as the Vidoscope Super Prominar, will be expanded in quarter-inch steps as soon as plant facilities allow, it was announced.



Closeup of the rear section of the new Vidoscope-Angenieux *f*/1.4 lens showing adjustment feature that allows the focal length to be varied within one-quarter inch, so that the size of a screen image may be altered slightly to fill a desired area.

YOUR BEST BUY
U. S. SAVINGS BONDS



OBITUARIES

NIQUET, OTTO J., charter member of Local 181, Baltimore, Md., died May 13. A member of the Local since April, 1909, he served in various official capacities. He last worked at Keith's Theatre in Baltimore until it closed its doors the latter part of 1955. He is survived by his widow, Mary.

• • •

S'RENCO, RUBY, 64, veteran member of Local 143, St. Louis, Mo., died May 14. He joined the local back in 1910 and worked in many of the top theatres in St. Louis. For a number of years he operated the S'Renco Film Screening Service and handled preview showings for the industry. He was well known in St. Louis screen circles for his willingness to extend a helping hand to others less fortunate than himself. Survivors are his widow, two daughters, and his mother.

• • •

CRAIG, HAROLD T., 57, member of Los Angeles Local 150, died suddenly on May 18.

• • •

STARKS, HARRY D., 63, member of Local 662, Danbury, Conn., died recently at the Portsmouth (N. H.) Hospital where he was undergoing treatment. He was a veteran of World War I. For a number of years he worked as an electrician for Warner Bros., traveling about the country. He later worked as projectionist at various theatres in and around Danbury, Conn. Until shortly before his death, Starks was projectionist at one of the local theatres in Rye, N. H.

• • •

GAGNON, JAMES, member of Detroit Local 199, was recently stricken with a fatal heart attack. A member of the local for the past 31 years, Gagnon was well-known in projection circles in the Detroit area. His wife, a daughter, and a brother survive him.

Kodak Earnings Keep Climbing

The Eastman Kodak Co. achieved higher sales and earnings during the first quarter of 1956 than in any other previous first quarter. The best previous first quarter figures for sales and earnings were registered in 1955. Consolidated sales in the U. S. for the 12-week period that ended March 18, 1956 were $154,744,604, up 4% over the corresponding period last year. Net earnings after taxes for the first quarter of 1956 were $16,998,185, a rise of 15% over the 1955 first quarter figure.

Stanley Warner Profits Rise

The Stanley Warner Corp. announced that the net profits for the quarter ending Feb. 25, 1956 represented a 60% increase over the same period last year. In addition to operating about 275 theatres throughout the U. S., SW is the producer and exhibitor of all Cinerama pictures.

HEARINGS ON TOLL TV

(*Continued from page 29*)

spent thirteen and one-half billion dollars for their sets in the expectation that they would be able to use them as they wanted without paying for the prerogative of watching."

Donald F. Conaway, national executive secretary, American Federation of Television and Radio Artists—"Employment opportunities of our members will be reduced. Not only the members of AFTRA but members of the entire entertainment industry will be adversely affected, as well as the unions representing stagehands, scenic designers, engineers and others."

Lawrence Tibbett, AFTRA—"The amount of money which its (toll TV) promoters say they expect to extract from American families in their own homes is greater than the entire amount presently spent for admission to all forms of entertainment in the U.S. If, therefore, the expectations of the pay-television promoters were realized, every branch of the entertainment industry would suffer."



ARE YOU A COUPON CLIPPER?

Most coupon clippers are far-seeing. They can recognize a good investment at less than 20 paces.
There are various types of coupons. The one below suggests a good investment, too. Smart showmen who clip this particular coupon are taking a short-cut to an investment that pays dividends in perfect sound, satisfied patrons, and vanishing service worries.
Mail it today and join 6,000 service-happy exhibitors.

SPECIALISTS IN MOTION PICTURE SOUND

ALTEC® SERVICE CORPORATION

161 Sixth Avenue
New York 13, N. Y.



ALTEC SERVICE CORPORATION
161 Sixth Avenue • New York 13, N.Y.
Please have an ALTEC representative call, without obligation, to inform me about your service contract.
Also please mail copy of booklet—
THE ALTEC SERVICE STORY.

Theatre

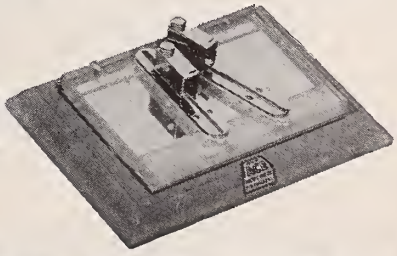
City and State

Ask for

Splicing Problems Are Coming!

If you're thinking of ordering a new splicer, be smart and investigate the Ace Clear Vision Film Splicer, a completely new method. From 8-mm to 70-mm.

- It makes a strong splice on acetate.
- Will splice the new DuPont Cronar base and join Cronar to acetate.
- It is non-magnetic — Will not injure CinemaScope soundtracks.



See your motion picture supply dealer or write direct to

ACE ELECTRIC MFG. CO., 1458 Shakespeare Ave., New York 52, N. Y.

MILITARY PROJECTION IN THE FAR EAST

(*Continued from page* 19)



FIG. 4. Front view of PAM-8002-B Integrator with latest series controller.

sion to magnetic stereophonic sound when and if distribution patterns change.

Emergency Facilities

Available Perspecta Integrators did not include sufficient emergency facilities to insure continuity of performance in the remote situations normal to overseas operations. Furthermore, they did not include facilities for useful operation and control of the side channels in the absence of control tones from normal single-optical soundtracks. The Japanese Perspecta licensee cooperated in the design and production of military models which do meet such requirements.

The first version, shown installed in Fig. 2, included manually controlled tone oscillators to simulate the Perspecta control frequencies. Vertical attenuators for the two side channels identify this portion of the assembly. Immediately below is a panel supporting dual preamplifiers. Normally one is connected to each soundhead, with changeover being effected by switching the appropriate output circuit to the Integrator input circuit. Emergency operation on one preamplifier is provided by another rotary switch which allows the input of either preamplifier to be connected to the output of either soundhead, thus transferring to this switch the changeover function.

Preamplifiers incorporate internal gain controls and phototube polarizing voltage potentiometers for machine balancing. The integrator proper occupies the lower portion of the cabinet. Its circuitry has been previously described in the literature. The present version is standard except for the mechanical layout shown in Fig. 3, and the inclusion of small slide switches on the top of each filter can to shift bandpass filter characteristics downward 4 cycles to accommodate the chronically low power line frequencies encountered in many portions of the Far East. Independent, dual power supply units for the preamplifier and integrator panels are located on the right side of every main amplifier cabinet.

Manufacturing and operating experience acquired from application of the first 25 equipment sets produced and installed allowed considerable design simplification, cost reduction, and improved performance and reliability in an additional 78 sets required. Control tone oscillators were discarded in favor of direct bias control of each integrator side-channel, variable-gain output stage during manual operation of the 3-channel system.

Preamplifiers, and the changeover and emergency switches, were moved up into the space vacated by the oscillators, reducing overall cabinet height by 5¼ inches as shown in Fig. 4. A third position was added to the changeover switch to handle a permanently connected record player circuit in this more convenient manner as compared to the plug-and-jack arrangement in the first model.

Access for Servicing

The preamplifier-control panel pulls forward on rails and tilts downward on hinges to provide the ready service accessibility shown in Fig. 5. Preamplifiers are located at either side of the chassis pan. Next inward are the vertical attenuators which provide manual control of side-channel gain, and which are internally illuminated whenever they are advanced from the infinite attenuation setting. The ganged master gain control for the three-channel sound system is in the center.

The initial Integrator's toggle control switches have been replaced by a three-position rotary master function

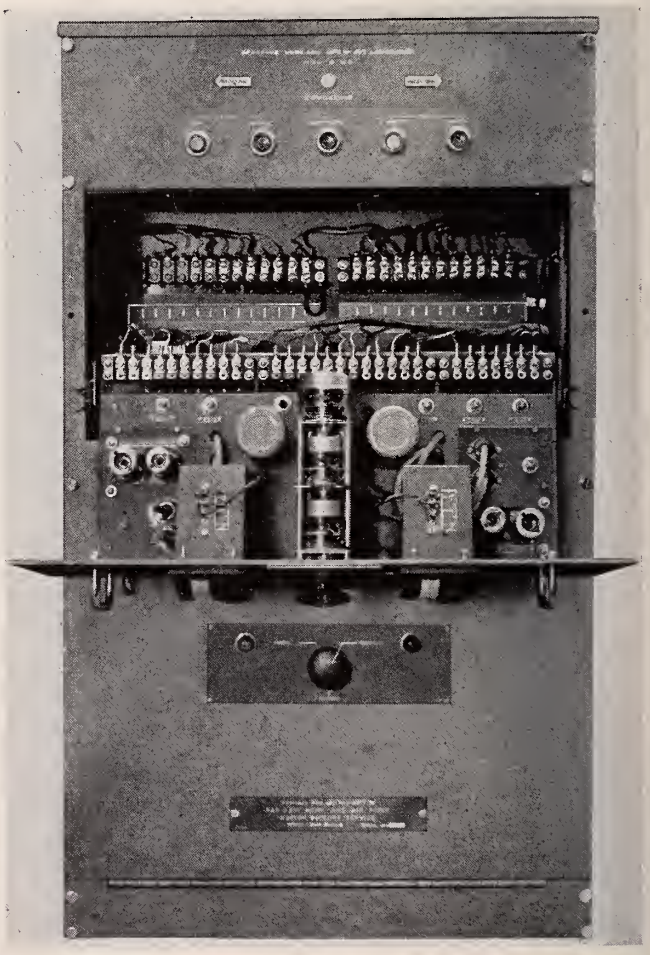


FIGURE 5.

View of PAM-8002-B Integrator with preamplifier panel drawn outward and turned down for service adjustments and access to internal cabinet terminal board.

switch and indicating pilot lamps. In its "Perspecta" position the integrator functions normally for Perspecta sound-tracks, including automatic reversion to single-channel operation on control tone interruption. In the "Manual" position side-channel gains are controlled by the two vertical attenuators. In the third "Bypass" position, both indicator lights remain dark and integrator circuits are entirely bypassed through a simple gain-equalizing network connecting the preamplifier output directly to the center channel main amplifier input circuit, an important emergency feature considering the number of tubes and components in the integrator.

American-made power amplifiers, exciter lamp power supplies and monitoring panels are mounted in cabinet-type racks. The lighter-finish panel near the bottom is a custom-built automatic line voltage regulator. Far Eastern power circuits are unfortunately subject to both poor voltage regulation and poor frequency regulation, the latter ruling out the use of resonated voltage regulators.

Little can be done about the frequency shifts other than to provide correct drive-gear ratios for the nominal frequency, together with measures already described in the integrator circuits to accommodate subnormal control frequencies. Electromechanical voltage regulators can provide very steady voltage, however, and radically reduce cases of poor performance and equipment failures caused by low line voltage or heavy surges.

The regulators incorporate a line sampling unit consisting of thyratrons in a bridge circuit which controls through relays a 2-phase servo motor geared to a variable autotransformer. This in turn is coupled to a line transformer and reactor to add or subtract corrective voltages as required. Output voltage is maintained at any selected value between 110 and 120 volts for single-phase input voltages in the range of 80 to 120 volts, 45 to 60 cycles.

2-Way Closed-Circuit Hookup

The Studebaker-Packard Corp. and the Grand Union food chain both climbed aboard the closed-circuit bandwagon recently with important sales messages via multi-city hookups. An interesting feature of both telecasts was the two-way audio arrangement enabling various links in the network to "talk back" to company officials at the TV point of origin.

CAROUSEL ROADSHOW

(*Continued from page* 22)

netic reproducing heads and necessary pre-amplifiers. The motor drive was of the Selsyn type also as used with the 3-D pictures.

In all but one of the theatres, the reproducer mechanism consisted of two flywheel loaded impedance, or scanning drums, between which the pickup head is located, two damped filter rollers and the usual drive sprockets and idlers.

The pre-amplifiers were adjusted normally for the CinemaScope mag-

Your concessions may delight gourmets...



Your lounge may be the smartest...

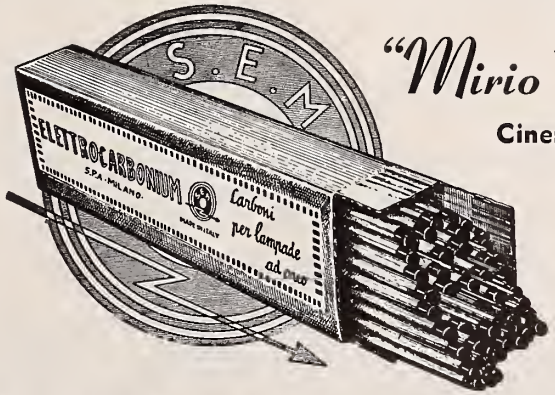


BUT EVERY PERFORMANCE STILL MUST BE PERFECT!

First matinee or midnight show, perfect perfarmances demand equipment that runs like a top. There's na expert like an expert RCA Theatre Service Engineer to keep everything humming. He's the *anly* man with full backing of RCA's lang-famed technical resaurces.

RCA SERVICE COMPANY, INC.
A Radio Corporation of America Subsidiary — Camden, N.J.

Your Best Buy — U. S. Savings Bonds



"Mirio"
Cinema Carbons

ELETTROCARBONIUM
VIA BORGHETTO. 5 — MILANO (Italy)

netic reproducing characteristic and trimmed to reproduce a suitable multi-frequency test film flat plus or minus 1 db from 100 to 8000 cps and plus or minus 2½ db from 40 to 10,000 cps.

Surrounds Carefully Used

The results were indeed gratifying in the theatre; there was none of the effect of the sound coming from any specific point behind the screen. Careful use of the surrounds further enhanced the sound effectiveness on the big choral and musical numbers.

Another noticeable effect resulting from the naturalness of the sound was that background music did not intrude upon the scene even though it was sometimes reproduced at substantial loudness compared to the vocal or dialog loudness.

As usual, it was found that the difference between reasonably good presentation and the really fine sound that could be had was in the details of adjustment of the theatre equipment. When the loudspeakers were correctly placed and properly phased; when the amplifier channels were balanced and the frequency characteristics made alike and with good high frequency response; when the reproducer mechanism introduced a minimum of flutter, then the result was noticeable to the exhibitor and the public and worth the time and trouble of doing this specific job.

We believe that the presentation of "Carousel" was substantially enhanced in those theatres where the six-track sound was used.

SPLICES NOT HOLDING ?

Film breaks are costly. Play safe by using

JEFRONA

All-purpose CEMENT

Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.

CAMERA EQUIPMENT CO.
DEPT. J-6-8
315 West 43rd Street New York 36, N. Y.

EIDOPHOR MAY REVIVE LAGGING THEATRE TV

(*Continued from page* 17)

the reach of theatre audiences of every community, large and small, no matter where located." This is certainly a pretty tall order, and yet, depending on how the producers and the public react to the new method, something like that can result.

The Eidophor projector is in some ways similar to the standard motion picture projector, being roughly the same size, weight, and shape. Furthermore, it employs the same light source as the motion picture projector—the carbon arc. It has the same type of electrical panels for the sound controls as are now commonly used, plus similar panels for the picture controls. Most screen sizes and throw distances can be accommodated with the Eidophor at a high degree of screen brightness and pictorial clarity as well as color fidelity. The significance of all this is that there is finally available a theatre projection system potentially capable of replacing a film with a video signal without loss of quality of reproduction.

The Eidophor optical system is a complicated and ingenious development that functions as follows: Light from the arc lamp passes through a lens onto a "schlieren" optical system positioned at a 45-degree angle. The schlieren system consists of a series of front silvered mirror strips equally spaced with slits equal to their width. Half of the incident light passes through the slits where it is absorbed and lost. The other half of the light is deflected onto the concave surface of a front-silvered spherical mirror.

Eidophor Liquid

In order to produce the Eidophor image, the concave surface of the spherical mirror has a thin coating of special oil, the Eidophor liquid. A portion of the area of the liquid is

Clayton Ball-Bearing Even Tension Take-Ups

For all Projectors and Sound Equipments

ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS.
SILENT CHAIN DRIVE

THE CLAYTON REWINDER

FOR PERFECT REWINDING ON 2000-FOOT REELS.

CLAYTON PRODUCTS CO.
31-45 Tibbett Avenue New York 63, N. Y.

N.T.S

Your Guarantee
of Consistent Quality
and Outstanding Service
For Every Theatre Need!

NATIONAL THEATRE SUPPLY
29 Branches Coast to Coast

Lorraine ORLUX SUPER-CHARGED LARGE-CORED *Carbons*

For DRIVE-INS & THEATRES with HUGE, WIDE-AREA SCREENS • CARBONS, Inc. BOONTON, N.J.

exposed to the illumination of the arc source and is also scanned by an electron beam carrying the picture information. The scanning beam stirs up deformations, thousands of little prisms, in the Eidophor liquid, and results in a light pattern duplicating the image being reflected upward through the schlieren lens and through a projection lens. The light then strikes an angled mirror and is reflected to the screen. In order to maintain the uniformity of the oily Eidophor liquid's refracting action, this liquid is kept under carefully controlled refrigeration by means of cooling tubes inside the mirror.

The Eidophor projector was specifically designed for closed-circuit color TV, and a system of field-sequential color reproduction was adopted. A rotating color wheel, synchronized with a similar wheel on the taking camera, is inserted into the light path between the arc lamp and the condensing lens of the projector. The color wheel contains filters representing the three primary colors. Each successive TV image or "frame" is tinted by one of these filters. When three images, each in a different primary color, follow one another on the screen, the eye of the viewer combines these images into an impression of full color.

An interesting feature of Eidophor is the arc lamp operation. The necessity of changing carbons every half-hour, as is usually the case with carbon arcs, would completely disrupt the continuity of a television program. Therefore, a method was devised which automatically welds the next carbon onto the one being used just before it is completely burned down. This process continues until the carbon magazine is exhausted. On the latest model, this provides for five hours of continuous illumination.

Simplified Control

Of particular interest to projectionists is the simplified control panel located between the projector and the monitoring equipment. The system has been designed so that it may be operated by any qualified motion picture projectionist without special TV training. Only three push buttons are required to set the entire system into operation. The vacuum system, refrigeration unit, and all other mechanical processes within the projector are actuated by one push button and are completely automatic. Furthermore, the system is so arranged and interlocked that any sequence of operation which might damage the apparatus is prevented from occurring.

The power input to the high-efficiency arc lamp which determines the maximum light available is 230 amperes at 90 volts, at a total power input of approximately 20 kilowatts. The Eidophor projector will produce a color picture with a highlight brightness of 10 foot-lamberts on a directive screen 22 by 30 feet. With the color wheel removed for black-and-white operation, four or five times this intensity can be obtained.

Still another advantage of the Eidophor is the similarity of the projection lens to that used in conventional motion picture projectors, which makes it suitable for the long throws in many large theatres. In other words, the Eidophor system will put theatre-TV projection back into the projection room along with the other projectors, rather than in the midst of the audience.

The Eidophor TV projection system, now in its advanced stage of development, could put new life into the theatre TV business. Its adaptability to theatre projection—large screen, high definition and contrast, brightness, long throw distance, color, etc.—can do much in reviving interest in telecasting events that have wide general interest. It might even bring on a new phase of multi-theatre, multi-city hookups. Sometime soon, 20th-Fox should demonstrate the new equipment. IP will bring a full report on it to its readers.



NO MIRACLES—NO FANTASTIC CLAIMS — NO MISLEADING PROMISES.

AVAILABLE AT ALL THEATRE SUPPLY DEALERS

FISHER MANUFACTURING CO.
1185 Mt. Read Blvd.
Rochester 6, N. Y.

HILUX®

WORLD'S FINEST ANAMORPHIC PROJECTION LENSES!

Comparison tests in famous theaters throughout the world have proven Hilux Anamorphic Projection Lenses vastly superior. Precision designed and built, they have optimum optical correction for color, definition and distortion. You owe it to your audiences to use Hilux Anamorphics for *ALL* prints.

HILUX VAL



An amazingly precise *variable* anamorphic that gives nan-vignetting perfarmance with *bath* 4" (101.6mm) and $2^{25}/_{32}$" (70.6mm) diameter prime lenses. Complete contral up to 2X withaut shifting lens or projector.

HILUX 264



A high quality 2X *fixed* anamorphic for all projection lenses up ta $2^{25}/_{32}$" (70.6mm) with a 64mm free rear aperture for maximum non-vignetting light transmissian.

HILUX 152



A 1.5X ta 2.0X *variable* anamorphic far all standard $2^{25}/_{32}$" (70.6mm) projectian lenses. 64mm free rear aperture assures maximum light with na vignetting.

Hilux 264 and 152 are available with either fixed ar variable carrectar lenses. For catalog sheets and facal length camputer, write Dept. P-66.

PROJECTION OPTICS

PROJECTION OPTICS CO., INC.
Rochester, N. Y. • London, England

SCREENS, APERTURES AND ASPECT RATIOS

(*Continued from page* 11)

old-timer, having been invented by David Brewster (England) at some time before 1850.

The third anamorphic system consists of two cylindrical mirrors, one concave and the other convex, positioned obliquely. By their double reflection of the light issuing from the projector lens, they produce the desired horizontal expansion of the image. This system, certainly the most scientific adaptation of the familiar amusement-park distorting mirror, was perfected for CinemaScope projection by A. Bouwers of Holland in 1953.

Each of these three types of anamorphic attachment has its advantages and disadvantages. The earlier cylindrical-lens anamorphots, we recall, were plagued by severe chromatic aberration that surrounded the vertical edges of objects in the projected pictures by chartreuse and purple fringes. The colored fringes merged, at a long viewing distance, into an indistinct blur.

A properly designed hypergonar (cylindrical-lens anamorphot) is said to give better image definition than a prismatic attachment; but the better prismatics certainly do very well. Present-day anamorphots of both types perform excellently when backed by "prime" lenses (regular projection objectives) of the highest quality. After all, any anamorphot, regardless of type, is at the mercy of the lens behind it.

Rarely Used in America

Cylindrical-mirror anamorphots are not much used in the United States. They are free from chromatic aberrations, of course; but since the curvature of the front-silvered glass mirrors has a greater displacing effect on light rays than similar curvatures in the surfaces of cylindrical lenses, the mirror surfaces must be ground with extreme accuracy to avoid unwanted geometric distortions. As it is, the warping effect of heat on the mirrors has been known to blur the picture.

Mirror anamorphots allow less light to pass on to the screen than do either hypogonars or prismatics. Specifically, the loss of light in a cylindrical-lens anamorphot is about 10% even when glass-to-glass surfaces are cemented and glass-to-air surfaces are antireflection-coated. The light loss in a prismatic anamorphot is approximately 20%, while the cylindrical-mirror anamorphot occasions a loss of from 30% to 40%, depending upon the condition of the cathodically sputtered aluminum silvering on the front surfaces of the two mirrors.

All anamorphots introduce more or less center-to-side falloff of light which, naturally, is added to the fadeaway produced by "hot-spot" aperture illumination by the high-intensity arc and and to the vignetting phenomena of the prime lens and its mount. Both cylindrical-lens and cylindrical-mirror attachments increase the falloff of light at the edge of the screen only very slightly—perhaps by about 5%,—while prismatic attachments increase falloff by fully 15%.

[TO BE CONCLUDED]

Drive-In Theatre Defended

When application was made recently for permission to construct a drive-in theatre in Cincinnati, Mrs. Dorothy Dolby, only woman member on the City Council, raised a big personal ruckus declaring that drive-ins are "terrible and out of bounds for my children."

Robert Morrell, general manager of the Twin Drive-In, the city's only drive-in theatre, quickly rushed to the defense of all drive-ins. Morrell neatly put it this way: "Had Mrs. Dolby investigated the facts before she allowed herself to be victimized by slanderous untruths, she would have found the biggest part of drive-in business is family business."

Morrell went on to say that the councilwoman's "hasty statement misled the public, seriously damaged a decent business whose function is to provide entertainment for families which, for lack of babysitters, would be unable to enjoy an evening away from home."

3,000-Watt Slide Projector

A 3,000-watt slide projector, Model SP. 1, has been announced by Genarco, Inc. of New York City. Equipped with a 3,000-watt tungsten bulb, it has a heat-reflecting filter, a 280 cubic-foot-per-minute double blower, an automatic slide changer for 18 standard 3½- x 4-inch slides, and a variety of objective lenses for rear and front projection in large auditoriums. It can be electrically tripped directly by the projectionist or by remote control. A fading effect can be attained between each projected image. With a wide-angle lens, 4,000 lumens are projected on the screen, enabling the projector to be used for studio backgrounds and ballroom sales presentations.

Revised Bodde Screen Price

The new reduced price of Bodde premium seamless screens for motion picture theatres is $1.18 per square foot. This revised figure does not apply to the translucent screen used in TV and motion picture processing, also manufactured by Bodde Screen Co.

Q: When is a mistake a blunder?

A: When a projectionist is not a regular subscriber to IP—a MUST reading for the projectionist craft.

Use the handy order form below

INTERNATIONAL PROJECTIONIST
19 West 44 St., New York 36, N. Y.

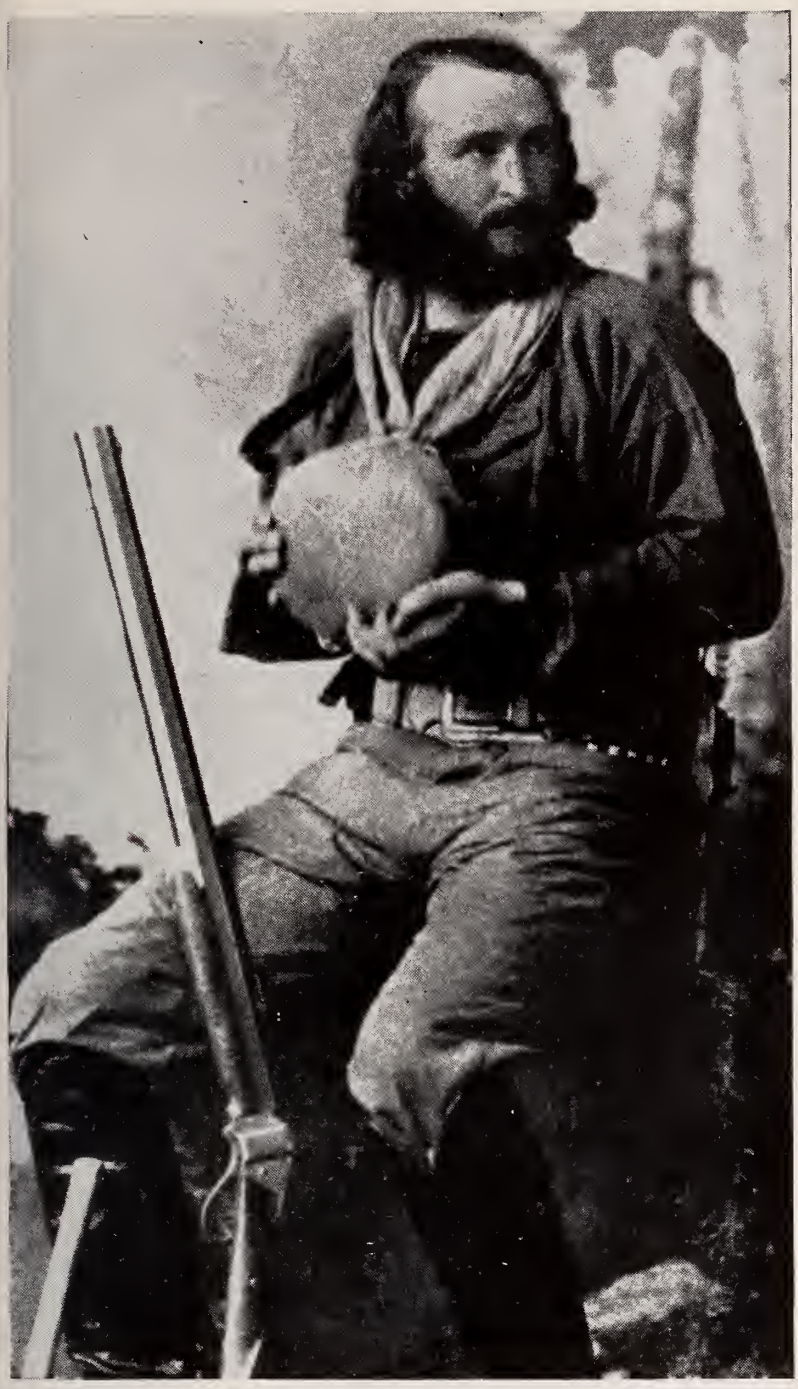
Enter my subscription for ☐ 1 year (12) issues—$2.50
☐ 2 years (24) issues—$4.00

Foreign and Canada: Add 50c per year

Name .....

Address .....

City ..... *Zone* ..... *State* .....



The man who named Tombstone, Arizona



THE SURPRISED government scout from Camp Huachuca reined his horse to a stop at the sight of Ed Schieffelin. And when Schieffelin admitted he was actually living and prospecting in Apache country, the scout warned him, "All you'll ever find'll be your tombstone."

But Schieffelin didn't scare easy. When he struck a silver lode in the desolate, dangerous hills of Arizona Territory, he called his first mine "Tombstone." And, unknowingly, he gave a name to a borning, brawling community soon to be notorious as one of frontier America's tough towns.

The Tombstone mine itself never amounted to anything. But Schieffelin just kept on prospecting — and within a few years, he turned out to be a millionaire. The hills he had risked his life in were practically made of silver.

Today's Ed Schieffelins are hunting uranium ore with Geiger counters, but their spirit is the same. And it is only part of the spirit of 165 million Americans who stand behind U. S. Series E Savings Bonds—who, by being the people they are, make these Bonds one of the finest investments in the entire world.

And, for an American, the very finest investment. Why not help your country—and, very importantly, yourself, by buying Bonds regularly? And hold on to them!

It's actually easy to save money—when you buy Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done *for* you. The Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, when held to maturity. And *after* maturity they go on earning 10 years *more*. Join the Plan today. Or invest in Bonds regularly where you bank.

Safe as America — U. S. Savings Bonds

The U.S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

PUBLIC SERVICE · ADVERTISING COUNCIL ·



"I'M DREAMING OF MY NEW SIMPLEX...

Sure I'm away on vacation. But, frankly, I can't wait to get back to work! Think I'm nuts? You're right! Completely nuts about the new Simplex equipment just installed in our theatre. What a performer! What brightness! What perfect sound! And dependable? There's never been anything like it . . . ever! If you're gonna' get new equipment at your theatre, speak up for . . .

Simplex
T. M. REG. U. S. PAT. OFF.

PROJECTION and SOUND SYSTEMS

MANUFACTURED BY
INTERNATIONAL PROJECTOR CORPORATION

DISTRIBUTED BY
NATIONAL THEATRE SUPPLY

SUBSIDIARIES OF
GENERAL PRECISION EQUIPMENT CORPORATION

GPE

JUL 20 1956
B 602862

PROJECTIONIST

INTERNATIONAL

JUL 27 1956



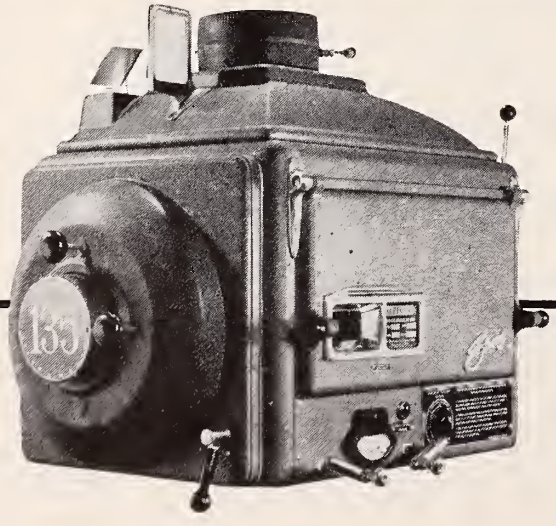
JULY 1956

VOLUME 31 • NUMBER 7

30c A COPY • $2.50 A YEAR

How a ball of gas influences your business





Send for free literature which describes all of the other reasons why Strong lamps outsell all others.

Startling advances and radical changes in projection techniques have imposed conditions of arc operation and control so critical, as to make the latest type lamps an absolute necessity to acceptable screen presentation. Error in the position of the positive crater, of as little as 1/32", can cause a light color change to blue or brown, and actual loss in screen illumination. A little of this and you'll also be losing business. The Strong Automatic Crater Positioning System, one of the features of the Strong Super 135 Projection Lamp, is your best insurance against such faulty presentation.

THE STRONG ELECTRIC CORPORATION

31 City Park Avenue • Toledo 1, Ohio

Please send free literature on Strong Projection Arc Lamps.

Name_____

Theatre_____

Street_____

City & State_____

International PROJECTIONIST

R. A. ENTRACHT, *Publisher*
JAMES MORRIS, *Editor*
R. A. MITCHELL, *Contributing Editor*

Volume 31 **JULY 1956** **Number 7**

Index and Monthly Chat 5

A Common Sense Approach to Screens, Apertures and Aspect Ratios 7
ROBERT A. MITCHELL

Curved Gate for Simplex Projectors 13
HERBERT BARNETT

Unique Indoor-Outdoor Theatre 14

Technician's Viewpoint 15

Wide-Angle Photography and Projection 16
GAYNE RESCHER

In the Spotlight 18

Modern Hardtop Theatre Added to Unity House . 19

IA Elections 19

The Ole Cranktwister 20
FRANK W. MACDONALD

Simplified Method of Color Kinescope Recording . 21
CHARLES H. EVANS

Ray Brian—"Movieana" Archives, X 23

Altec's Sound Caravan Invades Iowa 23

Brushup on Fundamentals, III 24

How Old Is the Wide-Screen Idea? 26
JAMES L. LIMBACHER

Personal Notes 28

Obituaries 29

Miscellaneous Items, News Notes, Technical Hints

INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co., Inc., 19 West 44 Street, New York 36, R. A. Entracht, President. Telephone: MUrray Hill 2-2948. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States and U. S. Possessions, $2.50 per year (12 issues) and $4.00 for two years (24 issues). Canada and Foreign countries: $3.00 per year and $5.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Entered as second-class matter February 8, 1932, at the Post Office at New York, N. Y., under the act of March 3, 1879. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1956 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

420

Monthly Chat

Drive-ins Move to the Front

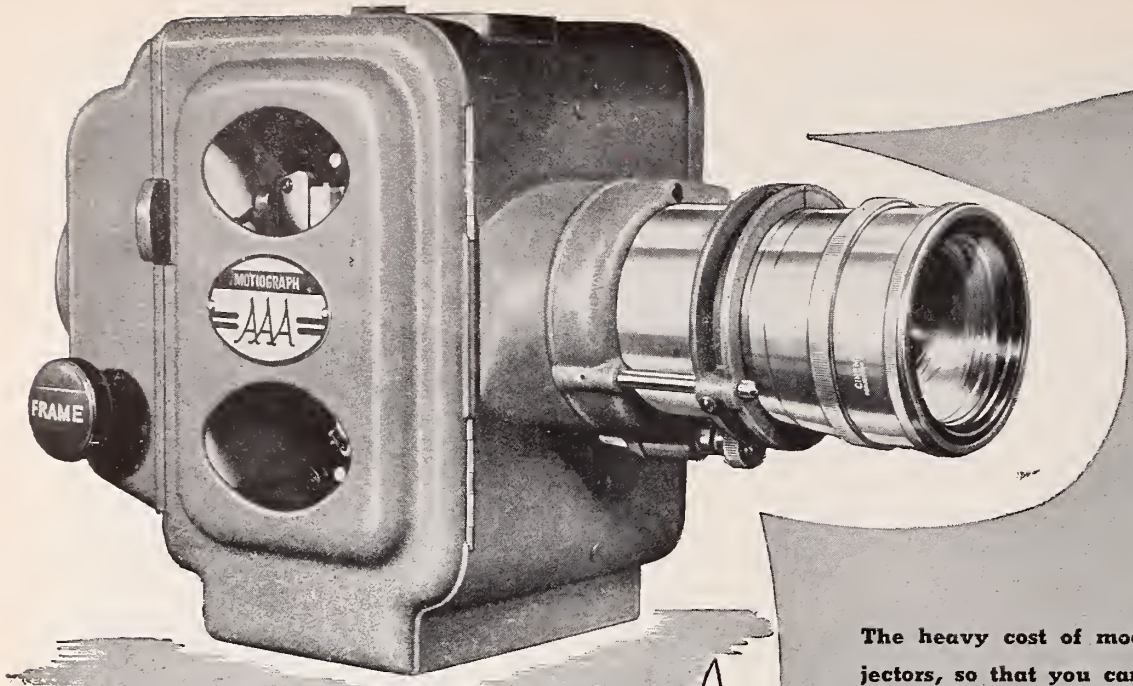
IF PRESENT signs prove correct, we are now entering a new era in the film exhibition industry. According to figures gathered by the Sindlinger research organization of Philadelphia, which conducts a continuing survey of the motion picture business, attendance at drive-in theatres climbed ahead of attendance at conventional houses during the last half of June. This is the first time in the history of the industry that drive-in viewers became a majority of all movie goers for a week or longer, and it happened at a time when the drive-in season had by no means reached its peak. In the week ending June 23, for instance, total attendance for all theatres was estimated at 51,657,400. Drive-ins got 50.9% of these customers while four-wall houses got 49.1%. No attendance figures for the week ended June 30 were available at press time, but there was every reason to believe that the drive-ins kept gaining. Once brushed off as "cow-pasture" operations, they will now dominate the summer season.

But that isn't the whole story. Perhaps even bigger news so far as the drive-in industry is concerned was President Eisenhower's signing of a bill authorizing the expenditure of over 34 billion dollars for the construction of a nationwide network of super highways during the next 13 years. When you consider these new roads along with Detroit's record-breaking automobile production volume, it becomes apparent that this year's gain is only another step in a continuing expansion.

All projectionists can take pride in the success of the drive-in business because the craft has played a vital part in its growth. Without in any way diminishing the role of the men who struggle with conflicting standards and unresolved technical problems in conventional theatres, it can surely be said that the outdoor projectionists have helped to accomplish the seemingly impossible. They did this by contributing their experience and skill to the job of projecting pictures of previously unheard of size—100-feet wide and even wider—in competition with the setting sun and all the stray-light hazards of a summer night.

New Fields to Conquer

A FEW WEEKS ago, the Dept. of Mass Communications of the United Nations released some very interesting statistics on the number of people, illiterates, daily newspapers, theatre houses, radio, and TV stations there are throughout the world. Taken all together, these figures should give long pause to the scare-mongers claiming that the motion picture market can no longer expand. Let us look at just one "little" country, Afghanistan, with 12,000,000 inhabitants and only *four* film houses. The fact that there is but a single theatre for every three million people takes on even greater importance when we consider that 99% of the population of Afghanistan is *illiterate*. This means that nearly 12 million people depend largely on sight (but not the written word) and sound (there are only 8000 radios in the country) for their entertainment and information. And if that isn't a market for movies, we don't know what is.



Why It's Just Good Business To Install

Motiograph AAA PROJECTORS Now!

The heavy cost of modifying your old projectors, so that you can play all prints, use latest type arcs, and avoid film damage, is ample reason for purchasing new Motiographs without further delay.

★ **PROJECT ALL TYPES OF PRINTS**—standard, CinemaScope, or combination optical and magnetic—without interchange of sprockets, rollers, shoes or tracks.

★ **CORRECT WORKING DISTANCE BETWEEN APERTURE AND MIRROR** with any make or model lamp including the new, big reflector arcs.

★ **MAXIMUM SCREEN ILLUMINATION.** Best center to side light distribution.

★ **AIR AND WATER COOLED GATE AND FILM.**

★ **ROCK STEADY PROJECTION.** Silent operation.

Now, more than ever, your projector dollars go farther with long-life Motiographs. There are no other projectors like them.

Your Motiograph dealer will gladly serve you. He has a liberal financing plan. Write today for literature.

Motiograph, Inc. "SINCE 1896"

4441 W. LAKE ST., CHICAGO 24, ILL.

Export Division (Except Canada): Frazar & Hansen, Ltd., 301 Clay Street • San Francisco 11, California

PROJECTORS • SOUND SYSTEMS • IN-CAR SPEAKERS • GENERATORS

INTERNATIONAL PROJECTIONIST

VOLUME 31 JULY 1956 NUMBER 7

Today projectionists must obtain a pleasing wide-screen picture by two widely differing methods, anamorphic and non-anamorphic projection. This is the concluding half of a two-part article.

A Common Sense Approach to Screens, Apertures and Aspect Ratios

By ROBERT A. MITCHELL

A COMPARISON of the optical merits of anamorphic and non-anamorphic projection is interesting and instructive. Needless to say, all of us are well aware that standard non-anamorphic projection at normal aspect ratio (from 1.333/1 to 1.375/1) has never been surpassed for clarity, brilliance, and rocksteadiness by either CinemaScope or non-anamorphic wide-screen. But when anamorphic projection is compared with non-anamorphic, all the various effects of increasing aspect ratio and image magnification must be considered.

The two principal aspect ratios of CinemaScope—2:55/1 for magnetic-track prints and 2.35/1 for optical-track prints—are significantly greater than 2/1, the widest a.r. used for non-anamorphic widescreen projection (not recommended). But CinemaScope may also be shown in the 2/1 a.r., hence direct comparison of image quality is possible.

Because the non-anamorphic wide-screen 2/1 aperture measures only 0.825" x 0.412", it lets through only 68.7% of the light transmitted by a normal 0.825" x 0.600" aperture. The CinemaScope 2/1 aperture, on the other hand, measures 0.715" x 0.715" and passes approximately the same amount of light (exactly 103.3%) as the normal 1.375/1 aperture.

Lens Efficiency

The anamorphic attachment wastes an appreciable amount of light, however, so in practice the total amount of light reaching the screen from the 2/1 CinemaScope aperture is not 103.3%, but nearer 93.1% when a cylindrical-lens attachment is used, or about 82.6% when a prismatic attachment is used.

Now, if the cylindrical-lens attachment be employed for CinemaScope, the 2/1 non-anamorphic wide-screen picture receives but 73% of the light which illuminates the 2/1 CinemaScope picture, the same lamp being used and the projection objectives having identical transmissions (t-numbers).

The comparison of illumination efficiencies may be carried further. Using the same 2/1 screen and projecting upon it a normal-format 1.375/1 picture having the same height as the two 2/1 pictures evaluated above in terms of projector lumen outputs, we find that the 2/1 non-anamorphic picture has only 47% the brightness of the conventional picture (same lamp, current, and carbons in all cases), and that the 2/1 CinemaScope picture has only 64% the brightness of the conventional picture when a cylindrical-lens attachment is employed for the CinemaScope. (Only 57% when a prismatic attachment is used.)

Comparative evaluations of this sort may be made by the dozen with the aid of the accompanying Table. To sum up the pertinent facts, we may say that non-anamorphic wide-screen projection in the 1.65/1 and 1.66/1 aspect ratios is a trifle brighter than "cylindrical-lens" CinemaScope projection (picture heights and arc power remaining the same), while the 1.75/1 a.r. gives a picture very nearly as bright as cylindrical-lens CinemaScope. If "prismatic" CinemaScope is shown, the 1.85/1 a.r. wide-screen has

about the same brightness, while all the smaller aspect ratios are brighter.

It should be noted that, inasmuch as all CinemaScope apertures have the same height (0.715 inch), our observations of CinemaScope's lighting efficiency apply to *all* CinemaScope aspect ratios, not to the 2/1 a.r. alone.

The 2/1 non-anamorphic wide-screen a.r. is notably less efficient lightwise than CinemaScope; and for this and other reasons, non-anamorphic wide-screen of so great an a.r. is not recommended. Only CinemaScope and SuperScope, anamorphic processes, satisfactorily handle 2/1 and greater aspect ratios.

Selecting Lenses

We must emphasize that picture heights on the screen are assumed, in these comparisons, to be the same for both anamorphic and all ratios of non-anamorphic projection. This is a condition easily attained, or at least closely approached, by selecting the proper focal lengths of lenses for each different process and non-anamorphic aspect ratio. And to select the right lenses, consult our easy-to-use table given on page 8 of the May 1955 issue of IP. Or, better still, use the "multipliers" to be given very soon in this article. Here's an example:

QUESTION: Our CinemaScope pictures are shown with 4-inch "prime" lenses. What focal length of lens should we use for 1.85/1 a.r. non-anamorphic wide-screen to get the same picture height on the screen?

ANSWER: (The CinemaScope-to-1.85/1 "multiplier" is 0.6238, so the answer is 0.6238 x 4 which equals 2.4952.) Use 2½-inch lenses with your 1.85/1 a.r. apertures.

Illumination efficiency is one thing; graininess, poor focus, buckle, weaving, and other defects inherent in excessive image magnification is quite another. A fuzzy, fluttery picture has a low VQ (visibility quotient) no matter how good the light may be.

Here again we may compare the appearance of 2/1 non-anamorphic wide-screen with that of 2/1 CinemaScope.

To show regular 2/1 wide-screen at the same picture height as normally proportioned 1.375/1 images, a magnification increase of 1.46 times is required. (Extra magnification is obtained by using lenses of shorter focus than the lenses for 1.375/1 a.r. pictures.) In other words, the film image is given extra magnification of 1.46 times in the vertical dimension and 1.46 times in the horizontal.

The 2/1 a.r. Cinemascope aperture has a somewhat *greater* vertical dimension than the normal 1.375/1 a.r. aperture. To get a same-as-normal height on the screen, therefore, a projection objective of slightly *longer* focus must be used to *reduce* the CinemaScope image—a magnification of 0.84 times normal. This is the vertical magnification (or, actually, *reduction*) of the CinemaScope picture relative to the normal-picture size.

CinemaScope Aperture

The anamorphic attachment for CinemaScope, however, has an expansion factor of 2. This means that the horizontal magnification of projected CinemaScope images is 2 times what it would be without the anamorphot. But because the relative reduction of the vertical dimension by the projection lens also reduces the horizontal magnification by the same amount, the *total* magnification of the horizontal dimension of the CinemaScope picture is 0.84 x 2, or 1.68 times the normal-picture magnification.

Now we shall use our figures for the relative magnifications of 2/1 non-anamorphic wide-screen and 2/1 CinemaScope.

Assuming that both the non-anamorphic and CinemaScope film images have the same degree of photographic resolution, or clearness, it can be understood that the 2/1 wide-screen image has only 1.46^{-1} (1 divided by 1.46), or 0.69 times the clarity of the normal 1.375/1 picture in both dimensions, while the CinemaScope image

RELATIVE ILLUMINATION EFFICIENCIES OF WIDESCREEN AND ANAMORPHIC PROJECTOR APERTURES

ASPECT RATIO	TYPE	APERTURE (Inches)	PROJECTOR LIGHT OUTPUT	RELATIVE SCREEN BRIGHTNESS When pictures same height	When pictures same width
			Non-anamorphic		
1.333/1	Standard silent	.906 x .6795	124.4%	128%	119%
1.333/1	Sound (obsolete)	.800 x .600	97.0%	100%	94%
1.375/1	STANDARD SOUND	.825 x .600	100.0%	100%	100%
1.65/1	Proposed standard	.825 x .500	83.3%	69%	100%
1.66/1	Widescreen	.825 x .497	82.8%	69%	100%
1.75/1	Widescreen	.825 x .471	78.5%	62%	100%
1.85/1	Widescreen	.825 x .446	74.3%	55%	100%
2/1	Widescreen	.825 x .412	68.7%	47%	100%
			Anamorphic (Expansion factor = 2)		
2/1	Optical & magnetic	.715 x .715	103.3% (theoretical)	71% (theoretical)	150% (theoretical)
			93.1 (cylin. lens)	64 (cylin. lens)	135 (cylin. lens)
			82.6 (prismatic)	57 (prismatic)	120 (prismatic)
2.35/1	Optical track	.839 x .715	121.2% (theoretical)	71% (theoretical)	207% (theoretical)
			109.1 (cylin. lens)	64 (cylin. lens)	186 (cylin. lens)
			97.0 (prismatic)	57 (prismatic)	166 (prismatic)
2.55/1	Magnetic track	.910 x .715	131.4% (theoretical)	71% (theoretical)	244% (theoretical)
			118.3 (cylin. lens)	64 (cylin. lens)	219 (cylin. lens)
			105.1 (prismatic)	57 (prismatic)	195 (prismatic)

NOTE: 10% off "theoretical" value for cylindrical-lens and 20% off "theoretical" value for prismatic, anamorphic attachments.

As indicated by the table, CinemaScope of any aspect ratio has about the same illumination efficiency (screen brightness) as 1.75/1 a. r. non-anamorphic projection *when cylindrical lens attachments are used for the CinemaScope*, or about the same as 1.85/1 non-anamorphic projection *when prismatic attachments are used for the CinemaScope*, picture heights on the screen remaining the same.

has 0.84^{-1}, or fully 1.19 times the clarity of the normal picture vertically, but only 1.68^{-1}, or 0.60 times normal clearness in the horizontal dimension.

CinemaScope, then, is at least as clear as normal 1.375/1 a.r. non-anamorphic pictures in the vertical dimension, but fuzzier in the horizontal. Non-anamorphic wide-screen, no matter what the aspect ratio. is less clear than normal in both directions. But since the visual clarity of CinemaScope is the average of its vertical and horizontal clarities, that is, 0.895 or practically 0.9 of normal 1.375/1 a.r. pictures, CinemaScope is theoretically clearer than even 1.66/1 non-anamorphic pictures, which have a clarity of 0.75 normal. (In practice, the clarity of CinemaScope is reduced to a maximum of 0.7 or 0.8 by the anamorphic attachment; and this is substantially the same as the clarity of 1.66/1 a.r. non-anamorphic wide-screen.)

Big-Negative Processes

It may be noted that, just as the VistaVision method of photography and reduction printing has improved the image definition of non-anamorphic prints, the Fox CinemaScope "55" method of photographing 55-mm anamorphic negatives, and subsequently reducing these to standard 35-mm CinemaScope prints, has similarly improved the clarity of CinemaScope pictures.

Our conclusion is simply this: considerations of illumination-efficiency and image-definition warrant the use of the anamorphic process (CinemaScope) for *all* pictures shown at aspect ratios greater than 1.66/1.

Yet another factor affecting the quality of anamorphic and non-anamorphic pictures is the *depth of focus* of the projection lens. Lenses of shorter E.F. than 3½ inches have so small a depth of focus that buckling movements of the film over the aperture are likely to be revealed on the screen as in-and-out of focus effects which, when rapid, blur the picture. It is important, therefore, that the projectionist check the focus on the screen rather often when using lenses of shorter E.F. than 3½".

Large-diameter, or "fast," lenses have a smaller depth of focus than "slow" lenses of the same focal lengths. But special types of fast, short-focus lenses utilizing the "inverted Dutch telescope" principle (for example, the Kollmorgen "X-tended" series of Super Snaplite lenses) have an exceptionally large depth of focus, minimizing the deleterious effects of film buckling on picture quality.

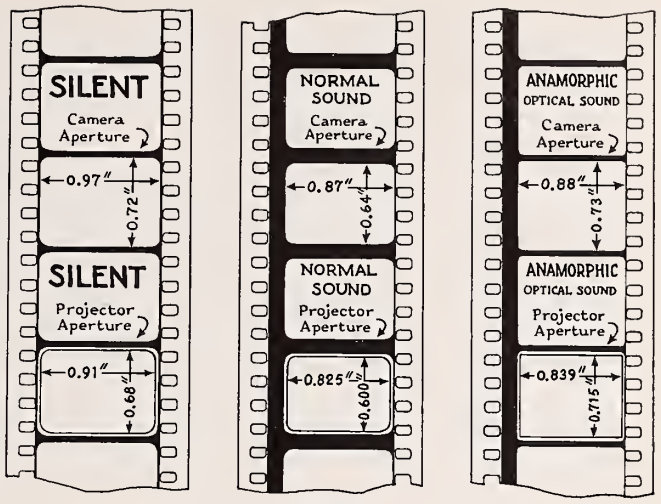


FIGURE 3.

Dimensions of silent, sound, and optical-track anamorphic camera and projector apertures. Note that the regular silent and soundfilm projector apertures are normally proportioned in the 4:3 ratio (a. r. 1.333/1 for silent pictures, 1.375/1 for sound). The anamorphic-film projector results in an a. r. of 2.35/1 when projected by correctly adjusted anamorphic attachments.

To match lenses for apertures of different heights to get the same picture height on the screen, use the following "multipliers," or factors for multiplying the focal length of an arbitrarily selected "standard" lens:

(a) *When the lens for normal 1.375/1 a.r. non-anamorphic soundfilm projection has an E.F. of* n *inches*:

For "silent" 1.333/1 aperture, 1.1335*n*; for 1.65/1, 0.8333*n*; for 1.66/1, 0.8283*n*; for 1.75/1, 0.7850*n*; for 1.85, 0.7433*n*; for CinemaScope at all aspect ratios, 11917*n*.

(b) *When "prime" lens for any aspect ratio of CinemaScope has an E.F. of* c *inches*:

For "silent" 1.333/1 aperture, 0.950*c*; for normal 1.375/1 soundfilm aperture, 0.8392*c*; for 1.65/1, 0.6993*c*; for 1.66/1, 0.6951*c*; for 1.75/1, 0.6587*c*; for 1.85/1, 0.6238*c*.

These "multipliers," or E.F. factors, reveal that when CinemaScope is projected with a 5-inch lens, the following lenses are needed for showing non-anamorphic pictures having the same picture height on the screen:

CinemaScope,	**5.00" E.F.**
Silent 1.333/1,	**4.75" E.F.**
Sound 1.375/1,	**4.20" E.F.**
1.65/1 wide-screen,	**3.50" E.F.**
1.66/1 wide-screen,	**3.48" E.F.**
1.75/1 wide-screen,	**3.29" E.F.**
1.85/1 wide-screen,	**3.12" E.F.**

Focusing More Difficult

Particular care is needed when focusing the picture when lenses for the 1.75/1 and 1.85/1 aspect ratios are used, for these lenses have relatively short focal lengths. Even when the 1.66/1 a.r is used, the lenses are so short-focus that film buckling and flutter are much more prominent than when CinemaScope is shown with somewhat longer focus lenses. In the case cited above, the CinemaScope lens has an E.F. of 5 inches, and the 1.66/1 a.r. lens has a focus of only 3½ inches (very nearly). In the days before CinemaScope and wide-screen pictures, we used to consider any lens of shorter focus than 4 inches a "short-focus" lens.

At any rate, it is one of the significant advantages of CinemaScope that the projection objective used with the anamorphic attachment has a longer focal length, and hence a greater depth of focus, than the lens required for any aspect ratio of non-anamorphic projection.

We have had reason to mention the old standard silent-film projector aperture several times in past articles. It is, in fact, the "parent" of the normal 1.375/1 a.r. soundfilm aperture universally employed until the popularization of wide screens in 1953.

Figure 3 shows the relative sizes on 35-mm film stock of silent, sound, and optical-track CinemaScope camera and projector apertures. The choice of the 4:3 proportion for the silent-picture projector aperture (a.r. of 1.333/1) was dictated by esthetic considerations, and standardized by the work of Thomas Alva Edison and the Lumière brothers.

The actual dimensions of the silent-film projector aperture were 0.906" x 0.6795", representing an a.r. of exactly 1.333⅓/1. This a.r. was preserved after the advent of sound pictures by the so-called "proportional" aperture (0.8" x 0.6"); but to obtain an a.r. of 1.333⅓/1 *at the screen* when

an average projection angle of 12 degrees exists. it was found necessary to increase the a.r. of the soundfilm aperture to 1.375/1 (0.825" x 0.600").

Leeway in Framing

The silent-film camera aperture was sufficiently large (0.97" x 0.72") to allow for small differences in framing and for slight misalignment of the projector lateral guide-rollers. The soundfilm camera aperture was also standardized at slightly oversize dimensions (0.87" x 0.64") for the same reason.

Now, the standard frame-shift performed by the intermittent mechanism of a 35-mm motion-picture camera or projector involves a longitudinal distance of ¾ inch; or, as 35-mm film is perforated, a distance of 4 sprocket holes along each edge of the film.

With the vertical dimension of the silent camera aperture, the thickness of the "framelines" between the individual frames was only 0.75 — 0.72 = 0.03 of an inch, hence practically all of the picture area of the film was utilized in silent-picture photography. It is otherwise in the case of sound-movie photography. In order to maintain the desired 4:3 proportionality of the frame images, the framelines necessarily became rather thick (specifically, 0.75 — 0.64 = 0.11 inch).

The loss of picture space in standard sound films is by no means serious, even though it represents a waste of 110 feet of film in every 1,000-foot reel—110 feet which must uselessly be pulled down by the camera intermittent without being exposed. The loss is slightly greater in projection, of course, because the projector aperture is slightly smaller than the camera aperture. In a projector using the normal 1.375/1 a.r. soundfilm aperture, 150 feet of film out of every 1,000 feet is never projected to the screen.

When non-anamorphic wide-screen apertures are used in the projector, the waste of footage—film which must uselessly be pulled down by the intermittent—assumes alarming proportions. In every 1,000 feet, for example, the following footages of film are wasted by the various non-anamorphic apertures:

ASPECT RATIO	WASTED FOOTAGE IN 1,000 FEET
1.375/1	150
1.65/1	250
1.66/1	253
1.75/1	279
1.85/1	304
2/1	338

Figure 4 shows what portion of the picture area of the film is actually projected upon the screen when 1.375/1, 1.85/1, and 1.66/1 a.r. apertures are employed.

The trend toward wider screen images, as we said before, is not wholly unattended by unfavorable consequences. For musical extravaganzas and "spectacular" productions involving vast throngs of people and panoramic scenery, the extreme CinemaScope aspect ratios serve admirably. Yet what a pity it would be if *all* movies were CinemaScope spectaculars!

The dramatic motion picture is intrinsically *emotional;* and emotion implies an intimacy of thought and feeling translated into photographic proximity to the individual actors, either singly or in small groups. The closeup shot, as well as the "roving" camera and "rapid" cutting by the film editor, is part and parcel of movie-making technique, and always will be.

It is desirable. therefore, that a compromise be effected for the best presentation of non-anamorphic films. CinemaScope is excellent in its own field, and its extreme aspect ratios should be utilized, wherever possible, for full panoramic scope. But the more *sensitive* dramatic photoplay is still best presented in less extreme aspect ratios, and, we may add, in monochrome instead of color. In expressing these views, the writer is merely echoing the opinions of many highranking movie producers who are increasingly reverting to the wider *dramatic* scope of the conventional aspect ratio and more or less ignoring the wider *visual* scope of the panoramic screen.

If the old conventional aspect ratios of 1.333/1 and 1.375/1 are considered a bit too restricted as regards the horizontal dimension, then certainly the 1.65/1 and 1.66/1 ratios represent the maximum (and perhaps the most desirable) width-to-height ratio that preserves the "fluidity" of screen drama—the use of closeups intercut into medium shots, "dollying" of the camera, etc. And yet these aspect ratios are wide enough to enhance the visual grandeur of panoramic long shots.

A Suggested Compromise

This writer definitely agrees with those motion-picture producers who advocate standardization of the 1.65/1 a.r. in the interests of pictorial framing. But universal exclusive use of the

(*Continued on page* 30)

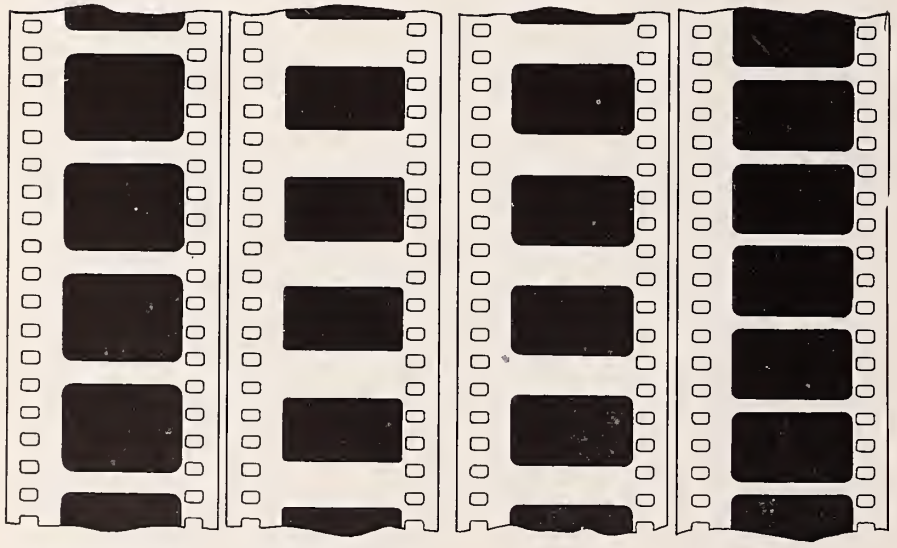


FIG. 4. The conversion from silent to "proportional" sound-picture apertures resulted in a rather large unused area between the individual snapshot-photographs, or "frames." With the use of wide-screen projector apertures, the waste of picture area became serious, as is shown by these tracings from raw film exposed in running projectors. Even with the least extreme of the wide-screen apertures (a. r. 1.66/1), however, the "frameline" areas can be reduced to reasonably thin lines by employing a 3-perforation, instead of the conventional 4-perforation, pulldown shift. This is illustrated by the film strip at the right. Other advantages of the 3-hole intermittent shift are described in the accompanying article.



"Want a light, mister?"

Want a really good light on your screen—

regardless of how big—

regardless of the projection process—

regardless of the film width?



EXCELITE "135"

PROJECTION ARC LAMPS

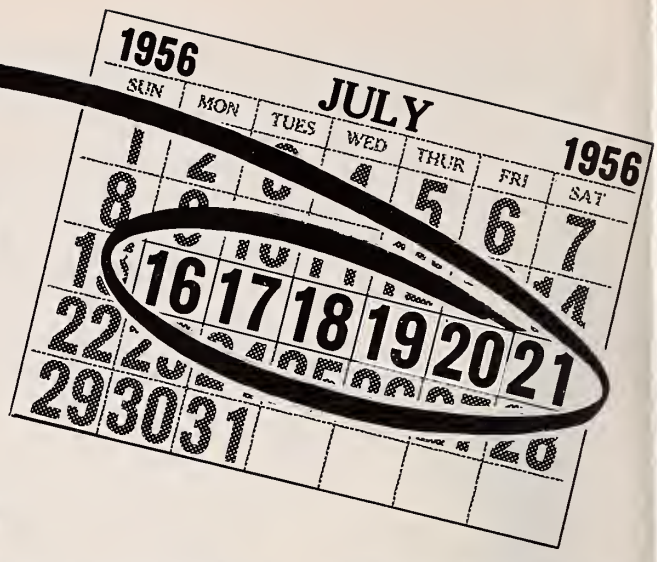
New conversion features ready for your adoption when you equip for wide film presentation include provision for burning 20-inch 13.6 mm carbons, a wider opening in the nose, a dowser which covers the bigger opening, and a new high magnification mirror. The Excelite "135" comes equipped with an 18" f 1.7 or 16-1/2" f 1.9 reflector and burns a choice of 9, 10, or 11 mm regular or 10 mm Hitex carbons, with single control amperage selection. Long-life positive carbon contacts. (Water-cooled carbon contacts optional.) Automatic Crater Positioning System prevents color change in screen light. Air jet arc stabilization keeps tall flame from reflector. Prevents deposit of soot and formation of heat absorbing scum which causes mirror breakage. Blower cooled removable Reflect-O-Heat unit for reducing aperture heat. Unit construction.

IT'S FROM NTS

NATIONAL THEATRE SUPPLY

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

THESE LEADING THEATRE GROUPS HAVE PLEDGED AUDIENCE COLLECTIONS



for the WILL ROGERS MEMORIAL HOSPITAL

DURING THE WEEK OF JULY 16:

LOEW'S · STANLEY WARNER · WOMETCO · FABIAN · RKO · MID STATES ALGER · WALLACE · SELECTED THEATRES · STRAND ENTERPRISES IOWA-UNITED · TRI-STATES · CHAKERES · DELFT · MIDWAY · STANDARD THEATRES · WAXMAN · FLORIDA STATE · LIGGETT-FLORIN · CAROLINA AMUSEMENT · GENERAL THEATRES · WELLON'S DRIVE-IN-THEATRES

Let's help our own!

PLEASE SIGN AND MAIL THIS PLEDGE FORM

TODAY!

We care



for our own

Here's my Pledge, Mr. Fabian!

Will Rogers Memorial Hospital
National Office
1501 Broadway, New York 36, N.Y.

SURE WE'LL HELP... you may depend on my cooperation in showing the Will Rogers Hospital appeal trailer, and taking up audience collections during the week of July 16, 1956.

THEATRE_____

STREET_____

CITY_____ STATE_____

PLEASE PRINT OR TYPE • FILL IN ALL INFORMATION

EXCHANGE AREA

CIRCUIT

MANAGER'S NAME

Curved Gate for Simplex Projectors

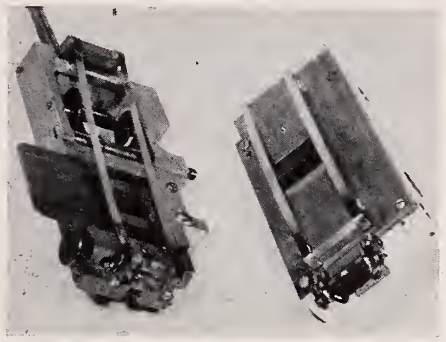
By HERBERT BARNETT
General Precision Equipment Corp.

Fluttering of film in-and-out-of-focus under high projection light levels is greatly reduced by the new curved film gate designed by General Precision Laboratory for XL mechanisms.

FOLLOWING a year's engineering study of the projection problems created by the use of more powerful arc lamps, General Precision Laboratory has designed a curved gate for the Simplex XL projector. The gate will be manufactured by International Projector Corporation and marketed by National Theatre Supply. It will be available both on new XL mechanisms and as a field modification for XL's already in service.

Recent trends toward larger screen sizes and the necessity for increased illumination to maintain adequate brightness have exposed certain limitations in the quality of the projected image when a flat film gate is used. One of the most serious problems is the maintenance of sharp focus over the screen area and throughout the exposure cycles of each picture frame.

High quality projection demands that the film be accurately positioned within the focal plane of the lens and that it remain fixed as nearly as possible within the depth-of-focus range. The lens setting tolerance within which a film image will remain in sharp focus is what is meant by depth-of-focus range.



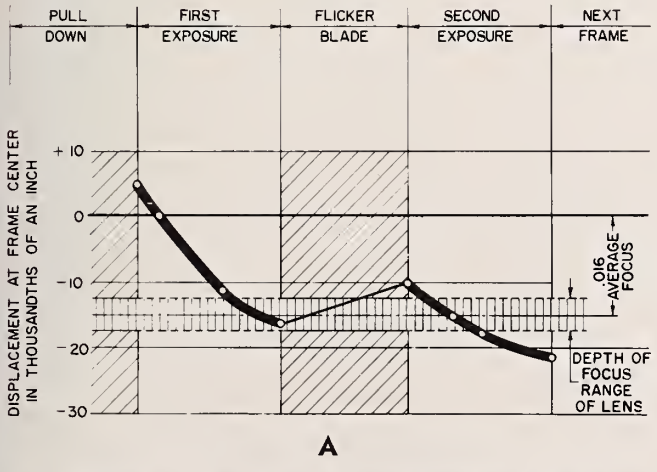
Hond-tooled experimentol model of the new trap ond gote for the Simplex XL projector. Note the shape of the rails on the projector gate. Flexible sheet pressure runners are ottoched to the trop. Contour of the rails determines the attitude of the film frame ot the operture.

The principal deterrent to sharp focus is the condition of momentary buckle due to heat absorbed by the film from the projection light source. When heat is absorbed in this manner, unequal expansion takes place between the film base and photographic emulsion. Conscquently, film at the aperture is distorted with a tendency to deform away from the lens. The process becomes continuously more pronounced at temperature increases during the projection cycle.

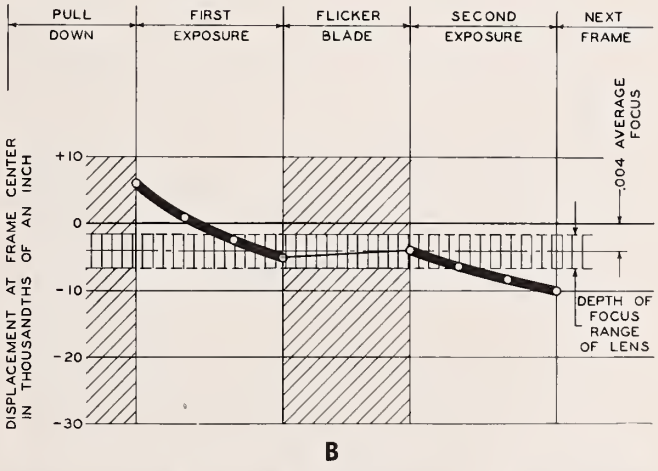
Film held in a flat gate and under the influence of high light levels will buckle or flutter at the center of the picture frame for a distance that is several times the depth-of-focus range of the lens. When this occurs only a compromise focus can be accomplished. This focus is neither constantly sharp over the projection cycle nor uniform from center to side of the screen.

Where light levels are not extremely high, momentary buckle does not result in serious permanent distortion of the photographic print. However, repeated passage through the projector at very high levels of illumination frequently causes the film to be permanently buckled in the sense that it no longer returns to its original shape. When this state has been reached, attempts to project such prints in the standard flat gate result in serious in-and-out-of-focus jitter due to buckling of the film that is opposite in direction to the expansion that occurred before the film was permanently damaged. The effect may be so extreme as to render the print unusable.

A curved gate properly designed will materially reduce the magnitude of film movement under the influence



A



B

The two graphs shown here deserve careful exomination by oll projectionists. The curve in Groph A shows the excursion or movement of the center of o film frame during the two projection periods. During these exposure periods temperoture rise due to heot absorption from the light beam couses the film base ond emulsion to expond unequolly, resulting in what is normally colled buckling. This curve shows the extent of excursion of the film in o stroight gote. The curve in Graph B shows the degree of reduction of the film excursion when a properly designed curved gote is employed. Restriction in buckling, afforded by the curved gote, odditionally improves center-to-side focus as indicated by corresponding figures for overage focus shown in eoch diagram.

of rising temperature. Furthermore, experiments with film so seriously damaged that it is unacceptable in a flat gate prove it can be projected from a curved gate with quite good results.

There are other plus factors associated with this development. In projection lenses the mean focal field is generally a curved surface rather than a true plane. The curved gate, as designed, tends to shape the picture area in such a way as to accomplish some improvement in uniformity of focus.

Variation in Lenses

It is recognized at the same time that there is considerable variation in field curvature of lenses depending upon manufacture, speed, focal length and other conditions, so that the degree of improvement to be anticipated is difficult to define. In most instances it has been found that there is worthwhile gain in definition.

In cases of film buckle there is an intermediate change between momentary distortion and permanent damage. As the emulsion shrinks, the photographic print tends to curl in an attitude transverse to its length. This represents distortion in the same direction as defects in focal characteristics of the lens. When shown in this condition in a straight gate, further deterioration in picture quality is experienced. When the same film is projected with a curved gate, there is a tendency toward elimination of the curl while the film is stationary. This results in further improvement in picture definition.

Introduction of the curved gate will be of prime importance for all types of theatres. Momentary buckle occurs in its most serious form during the first few passages of the print through the projector. This is particularly true where light levels are high, resulting in fast aging of the emulsion. The corrections which the curved gate provide will in some instances be of greatest importance to the first-run theatre. On the other hand, all too frequently, by the time the print has reached the subsequent-run house, it has been subjected to high temperatures sufficient to have introduced either severe curl or permanent buckle damage. In most of these instances a curved gate will permit acceptable showing of prints. Without it, this would not be possible.

Unique Indoor-Outdoor Drive-In Theatre

The impressive thing about drive-in growth today is not that more and more are springing up all over the country, but that they are growing bigger and more streamlined. How much they will grow and in which direction are indicated by a super deluxe indoor-outdoor combination drive-in soon to be erected in Babylon, Long Island in New York. Modernism, versatility, and informality are the themes of the proposed project designed by architect Drew Eberson for Associated Prudential Theatres. More than $1.000.000 will go into this unique venture scheduled to be started this summer.

Basically, the plan calls for the construction of a stadium type enclosed theatre with 1000 seats on the same plot as a new 1370-car outdoor theatre. A static parking area of 350 cars will serve patrons who choose to visit the indoor theatre. One set of box offices will accommodate all incoming cars. Once inside the grounds, patrons may make use of all the available facilities—the indoor theatre, the outdoor theatre, playgrounds, viewing terrace and dining area.

The Projection Rooms

Economy of construction will be achieved by placing the two projection rooms back to back. Furthermore, these will be equipped so that nearly all methods of widescreen projection can be utilized. The giant outdoor screen will be 123 x 52 feet and completely enclosed for use as a garage and storage place. The screen itself will be composed of specially treated extruded aluminum panels, developed by MancoVision and the Motion Picture Research Council. Seymour Seider of Prudential Theatres reports a reflective brightness from this type screen of 10 foot lamberts as tested by the National Carbon Co.

The indoor screen will be 51 by 25½ feet with a curvature depth of 11½ feet at the center. Variable Magnascope masking for top, bottom, and both sides of the screen will be installed. Architect Eberson has stated that the indoor screen installation will be changed in size and shape to accommodate the different modes of projection.

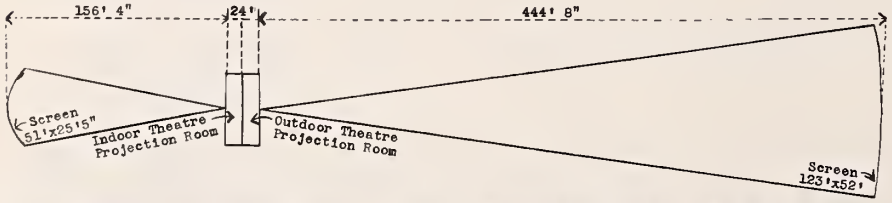


Diagram showing back to back projection rooms of outdoor-indoor drive-in theatre to be erected in Babylon, Long Island, N. Y. The million dollar project is expected to be completed in the spring of 1957.

Almost Straight Throw

Of prime importance in controlling distortion will be the angle of projection in both theatres. In the open airer, the angle of projection will be 4½ degrees; while in the enclosed theatre, angle of projection will be less than 3 degrees. The projection rooms are 21'7" above the ground level.

According to plans drawn up, many of the projection facilities will be shared by both projection rooms. This includes the rewind room, generator room, emergency electricity room, and the projectionists' toilet—but not the projectors, of course. Film, however, may also be shared. When both theatres feature the same picture, as will sometimes be the case, staggered starting times will permit the transferring of reels from one pair of projectors to the other and back again.

The main advantage of the new concept then are its economy and versatility of operation. A substantial portion of the facilities that are necessary to both theatres are operated in common. Also, the indoor theatre means earlier starting time in summer and a non-stop schedule during the cold winter months when many drive-ins are forced to shut down.

Study of Film-Storage Fires

The National Bureau of Standards of the U. S. Dept. of Commerce has published a new booklet, "Fire Effects and Fire Control in Nitrocellulose Photographic-Film Storage," which is an interesting illustrated report of some intensive research dealing with the hazards of nitrocellulose motion picture film. Results of the numerous experiments described in the 23-page booklet show the relative effectiveness of various safety devices in minimizing fire loss to film and danger to surrounding property.

Although the manufacture of nitrocellulose film in the U. S. was discontinued in 1950, large quantities of this type of film containing important historical data have been accumulated for preservation.

Single copies of the report may be obtained for 20 cents each from the Government Printing Office, Washington 25. D. C.

Technician's Viewpoint . . .

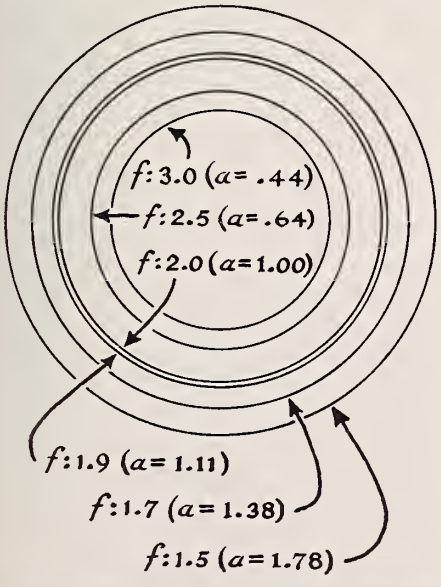
A monthly department that explores new ideas and current problems affecting projectionists.

MANY projectionists are confused by seemingly conflicting statements often made about the value of the new extra-fast lenses. On one hand, it is said that these lenses can greatly increase the light output of a projector; and on the other, it is often remarked that the advantages of a very fast lens are cancelled by the slower speed of most arc lamps and other limiting factors. Following are a few selected facts on the subject of fast lenses for theatre projection:

In cases where old-style uncoated lenses are replaced by modern coated ones, the anti-reflection coating has more effect in making the picture brighter than does the larger size of the lens. Uncoated projection "doublets" of the Petzval type waste from 25 to 35% of the light by reflection and absorption: coated "triplets" of the Gaussian type only from 8 to 12%.

The greater effective area is, of course, the *only* light-increasing factor when a coated lens is replaced by another of greater speed. Lenses of *f*:1.5 speed give screen illumination noticeably higher than that provided by *f*:1.9 or *f*:2.0 lenses. The brightness increase obtained with *f*:1.7 lenses over the *f*:1.9 speed is not significant.

Under actual projection conditions, however, the increase in picture light is not directly proportional to the increase in effective lens area. The beam of light emerging from the film aperture is not uniformly bright in cross section. An *f*:1.7 lens, for example, has an area 1.38 times that of an *f*:2.0 lens, but the middle of the beam intercepted by the lens is brighter than the edge zones. Each square millimeter at the edge of the lens, therefore, receives less light than a square millimeter near the center of the lens. Furthermore, the width of the beam at any specified distance from the aperture is affected by the optical speed of the arc-lamp mirror or condenser. The faster the lamp optics, the greater the increase in picture brightness with larger lenses.



Relative area of the lens openings designated by various F numbers.

With *f*:2 lamp optics, we find that an *f*:1.7 coated lens gives only 1.1 to 1.2 times, *not* 1.38 times, more light on the screen than an *f*:2.0 coated lens. This increase is almost too small to be noticed by patrons. An appreciable increase (1.3 to 1.4 times) occurs when *f*:1.5 lenses are used in place of the *f*:2.0 speed. But *f*:1.5 lenses are the largest practical in 35-mm. projection; and lenses as fast as this can be obtained only in the shorter focal lengths.

Magnetic pickup heads are another matter about which a great many mistaken impressions exist. Some people have the idea that, once installed, this piece of equipment will go on just about forever and never need replacement. Others think that they last no time at all and can be replaced only at great expense. The truth lies in between.

The longevity of the magnetic-cluster unit in a "penthouse" reproducer depends upon (1) the number of feet of film run through the reproducer at standard 90 feet-per-minute speed; (2) the hardness of the pole pieces; (3) the abrasive effect of the magnetic tracks, and (4) the pressure of the film against the pole pieces.

Different manufacturers guarantee longevities of from 3 to 7 million feet of film for their magnetic pickups. In experience it has been found that the life of these units varies greatly, even when of the same make, and is inconveniently short.

The average magnetic reproducing unit plays from 2 to 4 million feet of film before volume drops and distortion becomes noticeable. Continued use of the worn unit inevitably results in a serious output drop with intolerable distortion. The deterioration in sound quality is usually very sudden at this point.

Assuming an average life of 3,000,000 feet of film, the magnetic pickups in theatres playing about 20 hours of magnetic sound per week—10 hours for each projector—last only about a year. (90 ft./min. X 60 X 10 = 54,000 feet per week. 3,000,000/54,000 = 56 weeks.)

We don't know why it is that being in the theatre business causes some people to have short memories. We were asked last week if temporary repairs could be made on a damaged matte screen. Before the days of the new processes and big silver sheets, most of us were familiar with a number of tricks for making temporary repairs on white matte screens. Extensive marks, streaks, and soiled spots, however, can seldom be removed satisfactorily. Even when emergency measures are used, a soiled or torn screen must eventually be resurfaced or even completely replaced. Nevertheless, there are a number of steps that can be taken.

Temporary repair may be effected by grinding a stick of white chalk to a fine powder, placing the powder in a "trough" of paper, and blowing the chalk dust upon the soiled area of the screen to conceal the blemish.

If the screen is accidentally torn, join the edges of the tear with white adhesive tape on the back of the screen while an assistant carefully presses a square of clean plywood against the front of the screen. Then blow chalk dust upon the seam to render it less conspicuous.

While we're on the subject of screens, let us discuss the word, "lenticulated." How many of us are familiar with the exact meaning of this word, or with the variety of screens that can be described at lenticulated?

"Lenticulated" comes from the Latin *lenticula*, meaning "little lentil" or "little lens." A lenticulated screen, most exactly, is one having a surface composed of millions of tiny lens-like glass beads, transparent resin grains, or fragments of powdered glass "anchored" to the white backing material. The purpose of the *lenticulae* is to reflect light directionally.

Lenticulated screens of the kind mentioned above throw most of the light they reflect back in the direction of the source—the projectors—and thus differ from smooth aluminum-surface screens, which reflect mirror-wise. Projection angle and screen tilt have a tremendous effect upon the reflecting action of aluminized screens; none at all upon beaded,

(*Continued on page* 31)



FIG. 1—The distortion problem inherent in wide-angle lenses is basically the same no matter what wide-screen process is used. Horizontal and vertical line distortions can be minimized if not eliminated entirely through careful camera placement with relation to the lines, or by choosing a location for the action having no clearly defined lines—as in the wide-angle panorama scene shown above.

Wide-Angle Photography and Projection

By GAYNE RESCHER, A.S.C.

On the one hand, the wide-angle lens introduces distortions that later show up on the screen. On the other, it helps in obtaining the feeling of "participation" by the audience. This article appears here through the courtesy of the *American Cinematographer*.

WHEN the screen opened up for first time on Cinerama's roller coaster a new era was born in motion pictures.

Producers rushed their research departments to find ways of widening the standard screen, and today we are presenting all shapes and varieties of wide screens to the bewildered but interested public.

Somewhere along the line, however, we may have forgotten what started all this; we may have lost sight of the quality of wide screen that first intrigued us.

The Cinerama roller coaster sequence owed its effect not so much to the width or curvature of the screen as to the extreme wide angle with which it was photographed. The feeling of participation—which is really the only added dimension of Cinerama—is there only when wide-screen is combined with wide-angle and with movement. And yet the use of the wide angle lens with the various wide screen processes has been discouraged—in many cases by the very studios that developed the process—because of the problems of distortion.

Some studios, after a few unfortunate experiences, have recommended that no wide lenses be used for wide-screen photography. But this policy deprives them of one of the main advantages of wide-screen—putting the audience into the action.

Cause of Distortion

The distortion problem is basically of the same nature no matter what wide-screen process we are dealing with. It depends mainly on the angle of field covered by the lens. Obviously, the wider the angle of field, the greater the distortion.

While the problem is basically the same, there are variations with each process which I will not attempt to cover here. My purpose is to show the nature of these distortions rather than describe them in detail. We are therefore assuming in the following discussion that the projection setup is such that the projectors are level with the screen (as in Cinerama) and that no corrections have been made during printing, (As is possible with Todd-AO).

Let us assume that we are photographing a set of straight horizontal lines with an extreme wide-angle lens. When projected, the center line will be the only line that remains straight. Lines below the center will bend upward as they approach the edge of the screen while lines that are above center will bend down in a similar manner. This bend becomes more pronounced the closer we get to the top and bottom of the screen. (See Fig. 3). When thinking in depth we might say these lines bend back into the screen.

Now while this is a basic distortion. the straight line running through the

center (let's call it the line of no distortion) may vary in its position due to the projector-screen setup or other factors peculiar to the process in which we are working. This line of no distortion could easily be above or even below center; so photographic tests similar to the one described above are advisable.

Correcting Distortion

Now suppose we were to repeat the same test but instead of photographing the lines straight on we shoot them at a ¾ angle. We will find that the bend will hardly be noticeable and certainly not objectionable. The greater the angle from straight on, the less the lines will bend. (Fig. 4).

From the foregoing we can see a number of ways to help ourselves when we wish to use an extreme wide-angle lens on a scene containing pronounced horizontal lines. The most obvious, of course, is to keep horizontals in the center of the frame or wherever the line of no distortion happens to be. Unfortunately this is not always possible or desirable.

A less-obvious but often simple solution is to set up the camera so that the prominent lines in the scene are bent in the opposite direction, so that on the screen they will appear straight. When thinking in depth, it can be remembered that horizontal lines off the center bend back into the screen, therefore, these lines should be bent forward (toward the camera) an amount determined through the ground glass. (Or, on paper, if it is a question of set design.)

I worked on a picture recently in Cinemascope in which it was necessary in one setup to use a 35-mm lens. The scene was a building with a roadway running straight in front of the camera, and the tops of three park benches in the foreground. The far curb of the road ran straight and was close to the center of the frame, but the near curb ran across the screen in a pronounced curve, making a rather strange looking road.

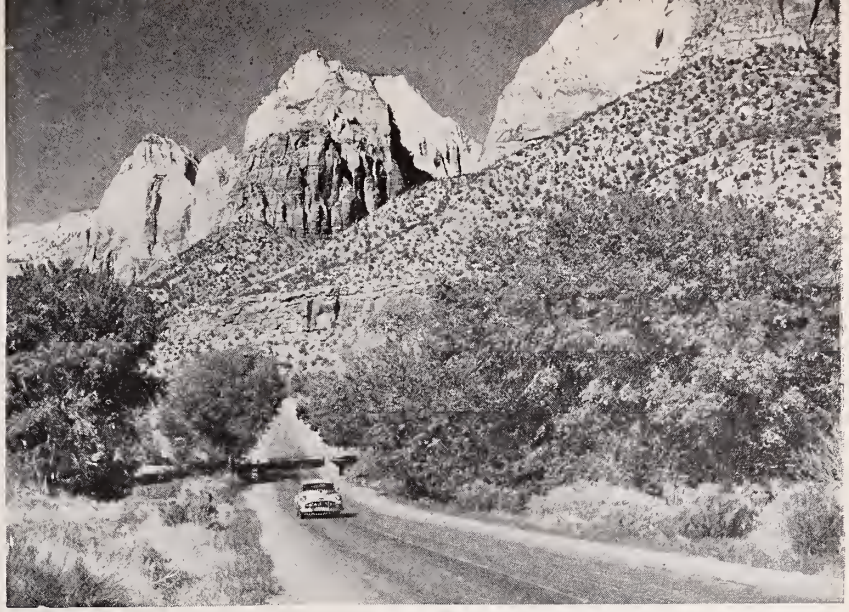


FIG. 2—Example of well-placed camera setup for wide-screen photography. Here distortion of the straight lines of the highway is minimized by shooting at a three-quarter angle.

We blocked the benches up slightly to cover the nearby curb, and, leaving the center bench straight, we angled the outside benches toward the camera.

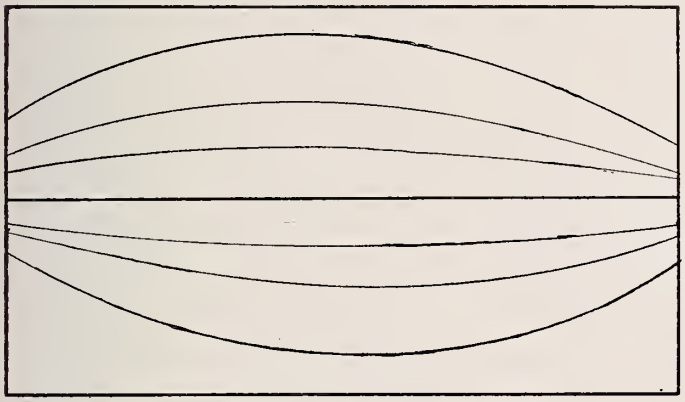


FIGURE 3.
How horizontal lines are bent when scene containing them is photographed straight on with extreme wide-angle lens.

When seen on the screen, the tops of the benches ran reasonably straight and parallel to the opposite side of the street.

Where possible, the easiest solution in a case of this kind, is merely to change the setup so that any lines in the upper or lower part of the screen become diagonals. In the scene just described, had it been possible to move the camera so that it was three quarters to the road, we would have had no problem.

Tricks with Scenery

Still another possibility—and one we had to resort to often with Cinerama—is to break up these lines by blocking them at some point. A floating piece of shrubbery is ideal for this—anything that will keep the eye from seeing the full length of that bent line. Of course, many lines look perfectly all right if they bend. A railroad track bending through the bottom of the screen may look perfectly natural, except when the train comes through and the cars bend in the middle!

If we repeat our line distortion test with vertical lines instead of horizontals and tilt the camera we will see the second basic distortion. The center line

(*Continued on page* 32)

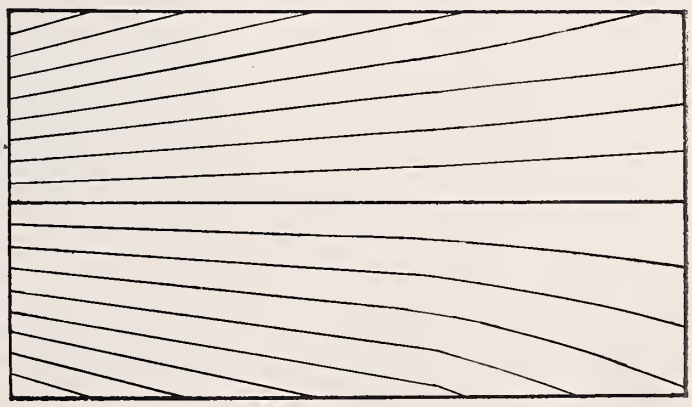


FIGURE 4.
When the same scene is shot with the camera placed at a three-quarter angle, the horizontal lines are bent only slightly.

In The SPOTLIGHT

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

IF THE nation's economy continues to expand at its present pace, then by 1975 it is more than likely that every retired person over 65 will have a monthly income of $200. This prediction was made recently by Clark Tibbitts, chairman of the committee on aging for the Department of Health, Education and Welfare. The $200 monthly figure is more than twice the amount the majority of over-65ers are receiving today. Tibbitts accounted for his high estimate by pointing to the continuing rise of deferred earnings, such as old age and survivors insurance, private pension plans, and personal savings.

The discussion arose in connection with a federal-state conference sponsored by the Federal Council on Aging and the Council of State Governments. It was revealed that only nine states have actually set aside money for offices and personnel to deal with the problems of the aged. These states are New York, California, Maine, Washington, Massachusetts, Rhode Island, Florida, Illinois, and Michigan.

The conference on aging is designed to investigate both state and federal responsibility on such topics as employment, retirement, income, housing, health, and recreation for people over 65. Readers should refer to the May and June issues of the *Spotlight* for interesting information concerning social security benefits and job opportunities for the worker over 45.

• In practically every field you will find people devoting a goodly amount of time, effort, and money toward a specific cause aimed at relieving the afflictions of their fellow workers, and at the same time striving to do the same for the public at large. This is particularly true of the entertainment field, where the Will Rogers Memorial Hospital stands out like a powerful beacon to members of the various segments of show business who have been stricken with tuberculosis—whether they be actors or musicians, projectionists or stagehands, etc.

In preparation for this month's drive for funds, more than 50 amusement industry leaders, including IA President Richard F. Walsh, who is a member of the board of directors, visited the million-dollar Will Rogers Hospital at Saranac Lake, N. Y., to discuss future plans as well as review progress already made. Opinion among the visitors was unanimous that the hospital was doing a wonderful job in taking care of the tubercular patients, but there still remained a tremendous amount of work to be done. As can be expected, the problem of raising money for the support of the hospital and its research laboratories is one of prime importance.

A very heartening revelation made by Dr. Morris Dworski, director of the Will Rogers Research Laboratories, disclosed that progress was achieved in the development of an anti-TB vaccine. It was reported further that the hospital may expand its facilities to include treatment of chest diseases other than tuberculosis.

All that is needed for admission to the Will Rogers Hospital is proof of employment in the amusement field and a doctor's recommendation for hospitalization.

A reserve fund goal of $1,000,000 by 1960 has been set for the hospital by treasurer S. H. Fabian. To achieve that goal every theatre and everyone in any way connected with show business must cooperate to make this 1956 summer fund-raising drive a success. The week of July 16 has been selected for theatre collections—let's all chip in and do our share in supporting this worthy cause.

• Cameramen's Local 659, Hollywood, Calif., has started a campaign to extend its jurisdiction in aircraft plants and other industrial fields having motion picture units. At present the Local is organizing a unit at the Lockheed plant in Burbank. The National Labor Relations Board recently completed hearings at the Boeing plant in Seattle, and

RENEWING AN OLD FRIENDSHIP



Leo (Muggs) Curry (left), veteran member of Local 396, Binghamton, N. Y., welcomes James J. Brennan, IA first vice-president, to the Local's recent 41st anniversary celebration.

WILL ROGERS HOSPITAL BOARD DISCUSSES 1956 FUND DRIVE



Members of the Will Rogers Memorial Hospital board of directors at the recent annual meeting. Shown here, left to right: John H. Rowley, president, Rowley Theatres; Alex Harrison, general sales manager, 20th Century-Fox Film Corp.; IA President Richard F. Walsh; Abe Montague, vice-president, Columbia Pictures; Robert O'Donnell, general manager, Interstate Theatres Corp.; Samuel Rosen, vice-president, Stanley Warner Corp. and Fabian Theatres; and Jack Cohn, executive vice-president, Columbia Pictures.

at Convair in San Diego. NABET (National Association of Broadcast Employees and Technicians) is contesting the IA at the Lockheed and Boeing plants.

• A decision of far-reaching importance was recently handed down by the Missouri supreme court when it ruled against picketing of the Hillcrest Drive-In Theatre by members of Kansas City Local 170. The opinion, written by Commissioner Cullen Coil, was the result of the Local's appeal to the supreme court on an order obtained two years ago by the theatre management to prevent further picketing of the drive-in. Members of Local 170 started to picket the drive-in back in 1954 when one of the co-owners took over the operation of the projection room although he was not a member of the union.

In his opinion Commissioner Coil held that picketing should be prohibited "so long as a bona fide owner or co-owner of the theatre operates the projection machines at such theatre."

• Labor forces in Louisiana scored an important victory recently when the state legislature repealed the infamous "right-to-work" statute, which in effect banned union shops. The combined efforts of the AFL and CIO, even before the grand merger, were largely responsible for the repeal. In a dramatic campaign directed against those lawmakers who favored the law, labor together with other interested groups succeeded last January in electing a "repeal" legislature. Governor Earl Long and State Senator B. Rayburn led the battle in the House and the Senate, and after hotly contested debates, finally pushed the repeal bill through a few weeks ago.

There remain, however, seventeen states that still maintain so-called "right-to-work" statutes on their books. The neat little "right-to-work" catch-phrase is more than a misnomer, it is an insidious misnomer.

Following the successful battle for repeal in Louisiana, State Senator Rayburn had this to say: "I hope that this victory by the working people of Louisiana will set an example which will give encouragement to working people in other states who are battling against similar union-busting laws."

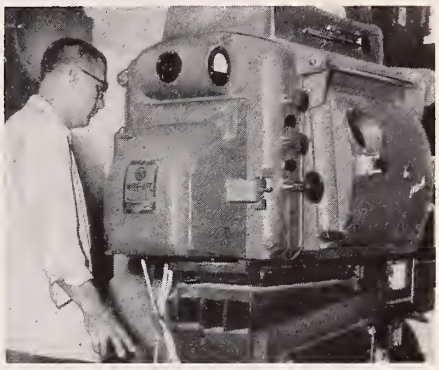
• The Tri-State Association, comprised of IA Locals in Ohio, West Virginia, and western Pennsylvania, held its 32nd annual meeting on Sunday, June 3, at DuBois, Penna. DuBois Local 703 was host to the delegates and guests. James V. Sipe, business representative for Pittsburgh Local 171, was re-elected secretary of the Association.

Modern Hardtop Theatre Added to Unity House, Summer Resort for Union Workers

Unity House, the union worker's paradise located in the beautiful Pocono mountains of Pennsylvania, recently added to its proud possessions a fully-equipped, completely modern, concrete-and-steel structured motion picture theatre house. The new theatre, which took a year to build, cost a total of $750.000, paid for by the International Ladies' Garment Workers Union, owner and operator of the nationally famous summer resort. In line with the long-established non-profit, policy of Unity House, there will be no admission charge to the theatre.

With a capacity crowd of 1,066 in attendance, dedication ceremonies last month included addresses by George Meany, president of the AFL-CIO; George M. Leader, Governor of Pennsylvania; and David Dubinsky, ILGWU president. High calibre entertainment was provided by soprano Marian Anderson and ballet dancers Andre Eglevsky and Melissa Hayden. Plans for the initial summer season call for bringing in the best movies as well as topflight live shows.

On the outside, the building is faced with limestone brick and is surrounded by trees. A large elevated projection room, a ninety-foot stage with wide diffusive screen and elaborate lighting and curtain apparatus, together with sloping orchestra floor and spacious lobby, as well as the other accessories necessary for a modern theatre comprise the interior. There is no balcony. Architects for the project were Rinker & Kiefer of Stroudsburg, Penna., and Benjamin Schlanger of New York City, consultant.



Joe Di Lorenzis, member of Local 710, Stroudsburg, Penna., projectionist at the ILGWU Unity House Theatre.

Supervising the installation of the latest type RCA sound and projection equipment was Harry Blumberg, member of Philadelphia Local 307 and RCA distributor in the Philadelphia area. One of the main features is a full stereophonic system, capable of handling both magnetic and optical prints. An elaborate loudspeaker system includes 20 different units strategically placed backstage and along the walls.

A pair of high-intensity Wide-Arc, ro-

(*Continued on page* 20)

NTS INSTALLS PROJECTION EQUIPMENT IN 1200-CAR AIRER



Projectionists Herb Marker (left) and Edwin Bigelow (right), members of Milwaukee Local 164, watch Frank J. Wagner, installation supervisor for National Theatre Supply, as he checks the projection room equipment of the recently opened 1200-car Victory Drive-In Theatre, Butler, Wis. The equipment includes Excelite "135" arclamps burning 10-mm Hitex carbons, XL projectors, and a Hertner generator. The picture throw is 375 feet to the 50' x 100' Manco Vision screen.

IA ELECTION

LOCAL 582, BRANTFORD, ONT., CANADA

E. W. Cripps, *pres.*; J. R. Truckle, *1st vice-pres.*; E. R. Pettifer, *2nd vice-pres.*; Arthur C. Roberts, *sec.-treas.*; H. Holden, *treas.*; C. M. Draper, *bus. rep.*; J. Faulkner, *sgt.-at-arms*; A. C. Fraser, D. Spencer, R. M. Magill, *auditors*.

The Ole Cranktwister

Our garrulous correspondent tells how he taught one of his novice pals (only about 40 years in the business) the facts of life about the use of changeover shutters.

AS CHAIRMAN of the Tecknologic Committee I had an occasion to straighten out one of our younger members not so long ago. This lad appeared before the Committee in a feverish state of highstericks over his troubles at the Leviathan Theatre. Wringing his hands and shakin like a lower loop, Freddie was. That's youth and inexperience for you. When the show goes wrong, these youngsters go all to pieces instead of usin cam jegement. That only comes with yars and yars of experience.

Lucky thing for Freddie that the Committee had previously decided to meet at Shea's place instead of at the Union Hall where that pious probishin crowd has wormed its way into temporary power. Come next election we plan to kick em out. Two quick boosters all around was required to cam Freddie down so the Committee could git a transloosened pitcher of jist what he was so skeered about.

It took quite some time. and a lot of loud shoutin back and forth to find the exact nature of the difficulty this boy was havin because Freddie dont hear so good anymore, account of he is getting a mite deef now days. As for my ownself, my hearin is extremely keen but my acoostic battery was run down jist then. Finally it comes out that Ole Twisters councel was required to find out why Freddie's changeover shutter wasnt closin on number 2 projector.

When Freddie makes the change to number 1 projector, end of part so-and-so. clicks, booms and a white screen takes place on number 2 before he kin race around and shut her off. Followin which comes a cresendo of boos, whistles and cat calls not comin from the sound system. And no amount of foot stompin will make No. 2 changeover close either. But when its vice-versa for a change to No. 2 projector both changeovers work OK.

The Boss was havin ravin paroxysms, and shoutin "Two Weeks Notice!" because this had been happenin off and on all evening. The difficulty was especially embearisin because the Levithan (we call it the Levi) is the biggest house in town. You kin easily surmise that from its name.

DeLuxe Operation

To make matters worse, the Boss is a new owner, and also new in the game —thars yore inexperience agin! He and our Business Agent been goin at it hot and heavy over the Seatin Capacity of the Levi. The Levi is correctly rated by our B.A. with a capacity of 1600. With a policy of four shows per day, and you fill up her 400 seats 4 times, that makes her a 1600 seater which in turn calls for our DeLuxe wage scale. If them figgers aint correct Ole Twister admits he cant tell the difference between CinemaScope perforations and Standard.

But this aint gitting our changeover back in workin order. That comes first, if only to relieve the burnin curiousity of everybody who wants to know what was ailin it. This Cinemetograph Diognostic Consultant (ahem) immejiately ruled out a burned out "close" coil because the evidence showed that it worked now and then. One member of the Committee—young and inexperienced of course—had to be slapped down for jumpin at this false conclusion.

Let us now lay the ground work for the exact cause of failure, but first a few statistics. A Gallop pole questioneer on the anatomy of the changeover switch would show that fully 99% of all projectionists know exactly what goes on in the innads of the switch when you stomp on it. However, for the benefit of the meek and lowly 1%, (and especially you Freddie) we will go through it fast and lightly.

All changeover switches and circuits are basically alike although some details may vary from this explanation. The changeover switch is a double-pole, double-throw type with one set of contacts normally closed, and another set normally open. The normally open contacts control the "open" coil of its respective machine. The normally closed contact controls the "close" coil actuated by the *opposite* projector.

Let us consider projector No. 1 and its changeover switch. You stomp on it and up comes the arm. As the arm moves upward the normally closed contact springs open making the "close" coil on No. 1 inoperative. When the arm reaches the end of its travel, the normally open contacts are closed energizing the "open" coil of No. 1. But the "close" coil of No. 2 projector is in this circuit with its normally closed contact in No. 2 switch. Hence, the "closing" of No. 2 works with the "open" coil of No. 1.

Now we were gettin down to cases as to what was causin the white screens at the Levi. Experience demonstrates that the normally-closed contacts burn out more frequently than the open circuit contacts because the closed contacts depend upon spring action. When the normally closed contact is burned out we have an open circuit in the "close" coil making it inoperative for that projector. Renew the normally closed contacts once per year and you eliminate one cause of high blood pressure for both the Boss and yoreself.

On our job at the Carousel theatre we aint had a failure since the days of Kinemacolor because we use fool proof changeovers. All of which reminds me to remember to change that frayed cord on the good ole gravity guilitines 'afore somethin really happins.

FRANK W. MACDONALD.
Local 199, Detroit, Mich.

tating, water-cooled RCA arc lamps do the bulk of the projection work. However. a 16-mm RCA arc projector has also been installed for special 16-mm films. Bausch & Lomb anamorphics, including back-up lenses, are used throughout. A motor generator feeds the arc lamps. The projection room is also equipped with the latest rewind machines and metal tables. In charge of the projection room is projectionist Joe De Renzis, Local 710, Stroudsburg, Penna.

Remote control of lighting in the theatre is achieved with a special dimmer board devised by the Century Electric Corp. A battery of pre-set high power spotlights is operated electronically from inside of the projection room. Screen dimensions are 40′ wide and 22′ high. A diffusive type material is used, which, it is claimed, can be viewed equally well from any angle.

Unity House, which comprises a thousand woodland acres with a mile-long private lake, has been developed by the ILGWU over the past 37 years as a low-cost summer vacationland for the members of all AFL-CIO bona fide independent unions. The resort is also open to the public, but rates are higher for non-union guests. Several unions have arranged to hold summer board meetings and conferences at the resort.

Kodak engineers adapt lenticulated-film, additive-color system for fast processing of kinescopes required in re-broadcasting of time-delayed color television programs.

Simplified Method of COLOR Kinescope Recording

By CHARLES H. EVANS
Eastman Kodak Company

GROWTH of color TV has created a demand for "quick kines" in color. These are motion-picture records of live TV shows, and they are made at the network facility where the program originates, by photographing TV pictures presented on special picture tubes known as recording kinescopes. The exposed film must be processed and ready for projection in less than three hours after exposure, because it is used for time-zone-delayed rebroadcasting to enable audiences in the eastern and western parts of the country to view the show at the same time of day.

Color pictures presented on special high-intensity television screens can be photographed on a typical color film, such as Eastman Color Negative Film, Type 5248. The difficulty comes in processing this film in time for the re-broadcast, because color development is a complex and time-consuming procedure.

No Color on Film

A new method of color-kinescope recording has been demonstrated at the Eastman Kodak Company research laboratories. This method utilizes 35-mm *black-and-white* film which can be processed simply and quickly to meet the demands of time-zone-delay. Three color-separation images are recorded on the film in black and white. One of these images represents the tonal gradations of the red parts of the subject, the second represents the green parts, and the third image represents blue.

In certain other additive color processes, three such images are recorded in the form of three individual picture frames. An outstanding feature of the newly proposed method of color-kinescope recording is that all three color-separation images are interlaced on a single 35-mm motion-picture frame. This in accomplished by means of very small plastic cylindrical lenses, called lenticules, which are embossed directly into the surface of the film base.

Similar lenticules were employed in the old Kodacolor additive color process for amateur motion pictures, and a similar film for theatre release prints is also available. Although very good color can be obtained by the lenticular additive color process, the big stumbling block encountered in practice is the severe loss of light which occurs during projection because a banded red, green, and blue filter must be placed in the optical system to impart color to the projected picture. The subtractive color processes give a much brighter picture.

Filters Not Needed

However, the color-TV system is additive, and therefore it is possible to employ an additive film process *without filters* both in kinescope recording and in subsquently televising the film records. The color TV camera employs beam-splitters and filters to derive red-, green-, and blue-separation pictures of the subject. The corresponding three electrical video signals generated by the TV camera can be used to control three separate kinescopes, and color-separation images will then appear on the kinescope screens. For kinescope recording purposes, it is not necessary that these screens be, respectively, red, green, and blue. In fact, the best phosphor for all three is one that gives off blue and ultraviolet radiation. If photographs are made of the pictures ap-

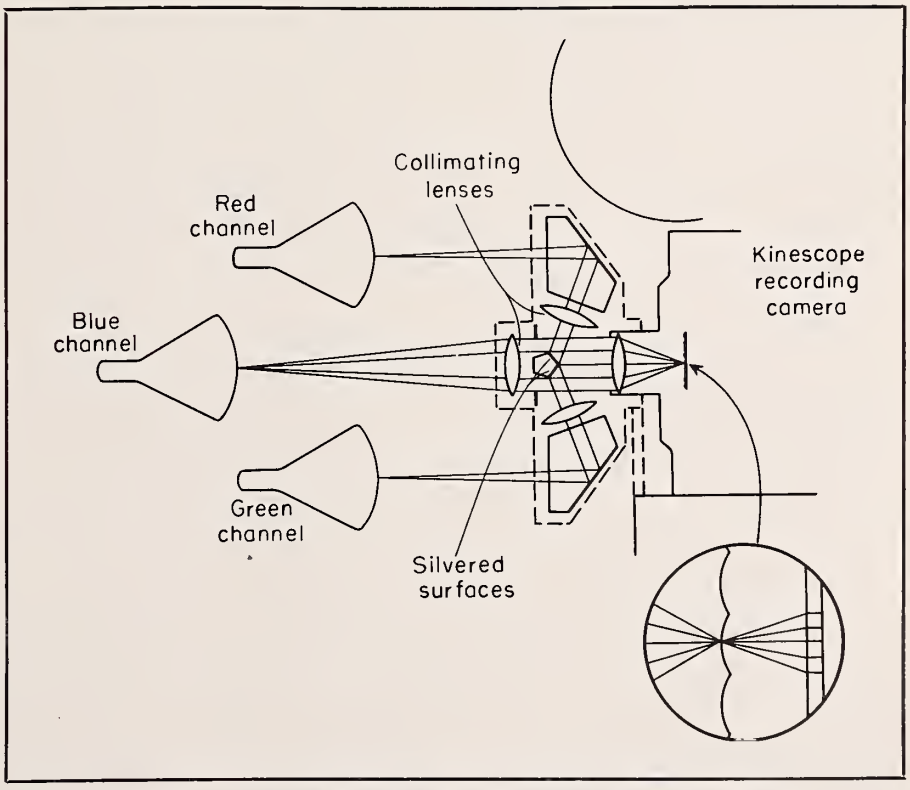


FIG. 1. Color-kinescope recording on blue-sensitive embossed film.

pearing on the three kinescope screens, then a set of three color-separation records will be obtained.

This is actually done in the embossed film method of color kinesope recording, but as pointed out earlier, all three separation images are combined, frame by frame, on a single strip of film. Figure 1 shows the arrangement of kinescopes, optical system, and recording camera. All of the kinescope screens are coated with P-16 phosphor, which emits blue and ultraviolet radiation.

A blue-sensitive embossed film records the images. The film is loaded into the camera with its base side toward the lens, so that light must travel through the embossed lenses before it can strike the light-sensitive emulsion layer. The lenticules on the film base are greatly enlarged in the diagram to show how they operate. Actually, they are very small cylindrical lenses, each 1/25-mm high, running all the way across the film, perpendicular to the edge.

The three color separations are recorded in different areas behind each lenticule by employing special apertures located in front of the camera lens. This lens images the three kinescope pictures in focus and in register on the film, and at the same time each one of the lenticules images the special apertures in focus on the very narrow area of the emulsion which lies directly behind that lenticule. Light from each individual kinescope passes through one of the apertures, and light from the other two kinescopes is excluded from that aperture.

Beam-Splitter Used

As illustrated in Fig. 1, light from the red-channel kinescope is directed to a silvered glass surface placed in front of the camera lens. This surface acts as the aperture for the red channel, and reflects the light into the camera lens. Light from the green channel is similarly reflected from an adjacent silvered surface. The useful light from the blue-channel kinescope is divided into two beams which pass above and below the two silvered surfaces.

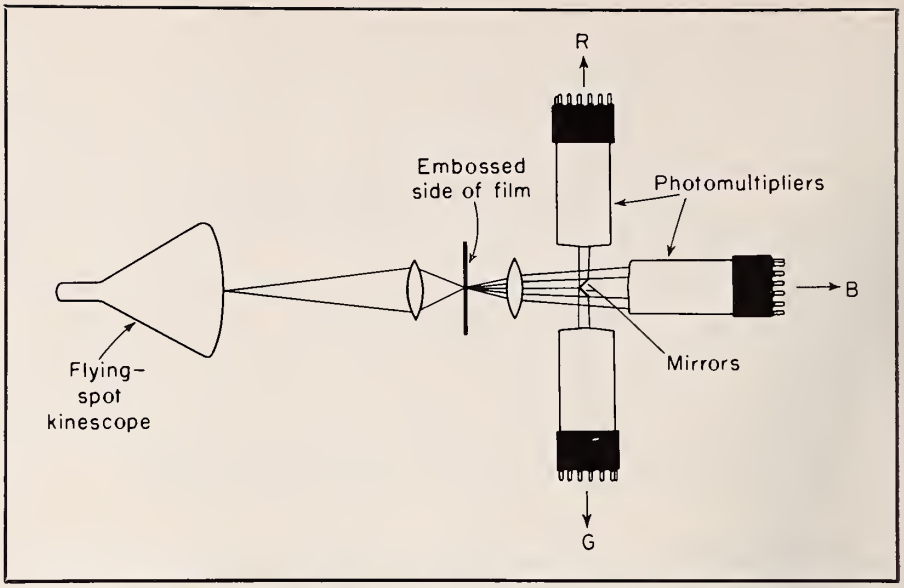


FIG. 3. Televising embossed film color records by means of a flying-spot scanner.

Figure 2 shows the effective apertures as seen from the lenticules. The insert at the bottom right side of Fig. 1 shows how each lenticule images these apertures onto the emulsion. From top to bottom, the four subdivisions of the emulsion area behind the lenticule receive images of the lower half of the blue-channel aperture, the green-channel aperture, the red-channel aperture, and the upper half of the blue-channel aperture.

Thus, the picture information on each kinescope is recorded within a specific area of the emulsion, interlaced with the information recorded from the other two kinescopes. Stated in another way, the picture as a whole is divided into about 390 horizontal strips, corresponding to the number of lenticules contained in the height of one 35-mm motion-picture frame, and each of these strips is subdivided into its three color-separation components. Although the developed silver images are colorless, nevertheless they contain the information required by the television system to produce a color picture.

This information can be fed back into the television system by any of the means commonly used to televise motion-picture film. However, special optical systems have to be employed. Figure 3 shows an arrangement utilizing a flying-spot scanner. The scanning spot is focused on the emulsion side of the film, and light transmitted by the various black-and-white color-separation images then passes through the lenticules. They project this light in bands corresponding to the apertures used in recording. A lens and mirror assembly separates the bands of light and directs them to three different photomultiplier tubes which generate, in accordance with the information recorded on the film, the "red," "green", and "blue" video signals.

In a three-Vidicon system, embossed film can be televised by inserting a banded filter in front of the projection lens to form a colored picture in the field lens commonly employed in that system. The sensitivity and the signal-to-noise ratio of the Vidicon tubes are sufficient to overcome the loss of light by absorption in the filter.

In addition to its direct use for time-zone-delayed rebroadcasting, the embossed-film original can also be used in a reduction printer to make ordinary 16-mm color prints. These prints are convenient permanent records which can be projected with any 16-mm projector, and which can be televised at any station having regular 16-mm color-TV projection equipment.

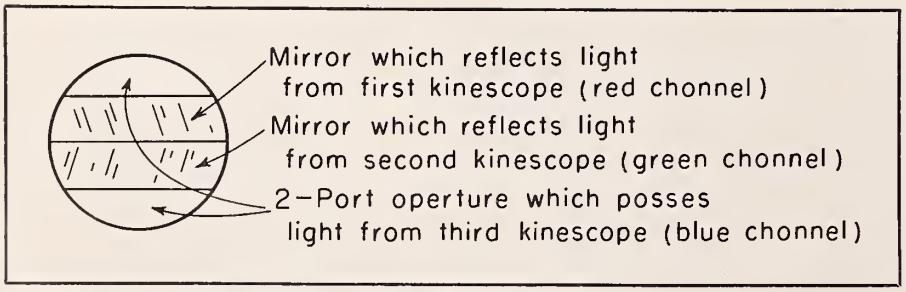


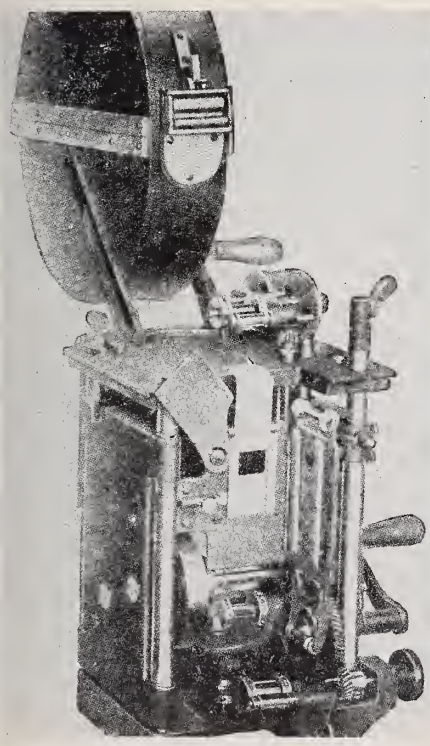
FIG. 2. Effective apertures of the three optical channels of Fig. 1 as seen from the lenticules.

Ray Brian—"Movieana" Archives, X

WITH THIS MONTH'S listing of items out of Ray Brian's "Movieana" archives, we bring to ten the number of installments taken from this remarkable collection of projection data, which includes photographs, literature, and often enough, actual models of projectors that have been used at different times in motion picture history. We believe that these compact monthly rundowns of old and new projectors have given projectionists a greater feeling of progressive continuity in an ever-changing field, as well as a greater appreciation of the modern streamlined machines that they use every day.

We all should be very grateful to Ray Brian, who is a veteran theatre projectionist and member of IA Local 434, Peoria, Ill. The only gratitude Brian wants, however, is any possible addition to his constantly expanding collection. Readers are invited to send their contributions to the editorial office of IP. Photographs especially would be appreciated. In the listing that follows, an asterisk at the end of an item signifies that photographs of the particular equipment named have not been located as yet.

RADION—made in France.*
RAYOSCOPE—made about 1900.*
REFLECTOSCOPE—*
RELIANCE—Robert W. Paul, London, 1906.
ROSENBERG—made in England, Augustus Rosenberg, 1896.
ROSS—made in England since 1919.



Selig "Polyscope" of about 1912.

ROTOGRAPH—
ROYAL—made in Chicago about 1915.
ROYAL—made in Japan by Komitz Co., 1953.
ROYAL-ZENITH—made in Duluth, Minn., 1930.
RUFFELL—made in England by Urban Trading Co., 1915.
SAFETY-CINEMA—*
SCENETOGRAPH—made in 1900 by Foersterling.*
SCENAMOTOGRAPH—made about 1900*.
SELIG—"Polyscopes", made in Chicago, 1897 to 1912.
SIEMENS—made in Germany.*
SPIROGRAPH—Chas. Urban, used a spiral glass disc, 1913.
SHINKYO—made in Japan, 1953.
SIMPLEX—Francis B. Cannock and Edwin S. Porter, since 1911.
SIMPLICINE—made in France by Gaumont, 1928.
SILENT-KNIGHT—also known as "Urbanora"—Urban Trading Co., 1912.
SINEMAT—*
SOLEIL—built by Stock in 1900.*
SOLIDUS—made in Brazil, 1953.
STANDARD—Chas. Ubelmesser, 1906 to 1918.
STERN—1912.
STINETISCOPE—made about 1900.*
S.U.P.A.—made in England by B.T.H., 1948.
SUPERIOR—Coxsackie Holding Co., 1922—Blue Seal Products Co., 1939.
SUPERIOR—made in Japan by Fuji Co.
THEATROGRAPHE—Robert W. Paul's first machine, 1896, English patent #4686.
THOMPSON—Lawrence Thompson, 1895.*
THOMSON-HUSTON—made in England by B.T.H., 1930.
TITANUS—made in Milano, Italy, by Pio-Pion, 1953.
TRIUMPHATOR—made in Germany by A.E.G.
TRANSATLANTIC—1922.

Altec's Sound Caravan Invades Iowa

The Altec sound-promotion caravan, led by publicity director Bert Ennis, is continuing its travels through selected areas of the U.S., bringing to movie goers interesting information about the stereophonic sound they hear in their local theatres. One of the first theatres visited was the Carolina in Sumter, S. C., reported in the May issue of IP. A more recent and equally successful visit was made to the Carroll Theatre in Carroll, Iowa.

The idea behind the whole campaign is to get patrons to take a greater interest in technical improvements at their local theatres, and to stimulate theatre attendance. Local newspapermen are invited to tour the theatre with an Altec field engineer, the theatre manager and the theatre projectionists. A thorough explanation of stereosound is supplied the men of the press who then write feature articles on the subject for their newspapers. Illustrated with a series of special photographs taken at the theatre, the articles arouse a high degree of reader interest and everyone concerned benefits.

At the Carroll Theatre, Dick Bevier of Altec, and projectionists Tommy Lambert and Ralph Anzevino helped editor Howard Wilson gather the interesting facts for his paper, the *Carroll Times-Herald.*

Another and more direct way of informing movie goers about stereophonic sound has been devised by Altec. This involves the use of a special test reel for audience screenings—Altec Test Film ED-49. The reel presents a piano solo, during which sound travels from left, center and right behind-the-screen speakers and to surround speakers located throughout the auditorium. At the same time, a recorded narration describes the path of the sound.



Tommy Lambert (center) and Ralph Anzevino (right), projectionists at the Carroll Theatre, Carroll, Iowa, watch closely as Altec field engineer Dick Bevier uses a degausser to demagnetize a projector part. The projectionists participated in recent stereophonic sound demonstrations conducted by Altec Service Corp. to familiarize the public with stereophonic principles.

Responses to the reel by patrons who witnessed it at the Carroll Theatre were highly enthusiastic, it was reported. They regarded it in the nature of an interesting and illuminating short feature.

World's Smallest Too Big

In Hamburg, Germany, an art theatre was forced to close as a result of a fire department charge that it was "overseating." The Studio One Theatre had the reputation of being the smallest theatre in the world, with 25 seats. The fire department claimed there should only be 17.

Brushup on Fundamentals

III

What is Voltage?

Many names have been used to define electrical pressure. These include "electro-motive force" (often abbreviated to e. m. f.), "potential difference" or simply "potential," "bias," and "voltage." The term most commonly used is "voltage."

Voltage is the force that is responsible for the flow of electrical current through wires. In commercial electricity voltage is created either by chemical action, as is the case when batteries are used, or by generator action. Sometimes generated electricity is not suitable for special applications due to the fact that it is not as smooth a form of electrical force as that which is available from a battery. One such application has been of special interest to the projectionist.

We can all remember the early days of sound pictures. In those days it was almost impossible to light the exciter lamp in the soundhead with commercially generated electricity. This type of electricity had some irregularities in its waveform which caused the exciter lamp to flicker slightly. Although the eye could not discern this slight flicker the photoelectric cell, being much more sensitive than the human eye, could do so easily. The result was an audible hum which was evident throughout the entire picture. The battery with its steady waveform proved to be satisfactory as the source of pressure necessary to light the exciter lamp.

The case just mentioned is an exception because, as a rule, commercially generated electricity is to be preferred to batteries due to the resultant economy and freedom from maintenance worries. Even here the problem was finally solved by the use of a filter which removed the irregularities from the electricity.

How does a battery or generator function?

To say that a battery or a generator is a pressure is not strictly true. What we really mean is that these devices have across their terminals a difference of pressure. What do we mean by a "difference of pressure?" Reference to Fig. 8 (a), which shows two tanks connected by a small pipe, will help to answer this question. When the stopcock in this sketch is opened nothing will happen because the pressure in both tanks is equal. This pressure depends upon the height of the liquid in the tanks. Since the water in both tanks is shown to be at the same height, it stands to reason that the pressures are equal.

Let us suppose that the pressures in both tanks are equal to 100 pounds. The pressure in tank *A* tries to force water into tank *B*, while the pressure in tank *B* tries to send water into tank *A*. Because the forces are of equal strength and are acting in opposite directions, they will neutralize each other and the water will be unable to flow from one tank to the other.

If you will refer to part *b* of Fig. 8 you will note that tank *A* now has a higher water level than tank *B*. Due to the higher water level in tank *A*, more pressure will be exerted by it than by tank *B*. When the stopcock is opened water will flow from tank *A* into tank *B* because of the difference in pressure between these two tanks. When the water level in the two tanks is equal the pressure in them will also become equal and no more water will be able to flow between the tanks. It has now been proven that water will not flow unless acted upon by a difference of pressure. The same reasoning holds true with an electric current.

Electrons cannot flow through a wire unless acted upon by a difference of pressure. It has already been stated that a battery or a generator is a device which contains a difference of pressure called a voltage. In the case of air pressure we have a unit called pounds per square inch. For example, air has a pressure of 14.7 pounds per square inch. This unit tells us something about the magnitude of air pressure. In electricity we must also have a unit which tells us something about the magnitude of electrical pressure. The unit which conveys this information to us is called the volt.

For example, let us compare a 6-volt battery with a 1.5-volt flashlight cell. Since the volt is a unit of electrical pressure then 6 volts would represent more pressure than 1.5 volts. If the smaller battery were connected to a low voltage bulb, the bulb would light dimly. Suppose that the small battery were now disconnected from the bulb and the larger battery were substituted in its place. We can guess what would happen. The bulb would now burn brighter. Why? The explanation is very simple. Since the 6-volt battery contains more pressure than the 1.5-volt cell the larger battery is capable of forcing more electrons through the bulb than the smaller one.

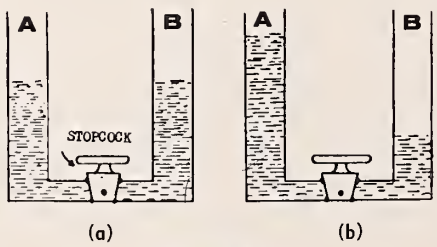


FIGURE 8.

The reason a bulb lights at all is because the electrons that are forced through its filament cause the filament to heat to the point of incandescence. The wire then becomes white-hot and emits light. The number of electrons that pass through the filament will, therefore, determine the brightness of the lamp.

How does the term voltage sometimes confuse the layman?

Last month we established the fact that a flow of electrons through a wire constitutes an electric current. The layman usually confuses voltage and current. These terms are as different from each other as day is from night, despite the fact that one is dependent upon the other. Voltage is electrical pressure, but current represents the number of electrons that flow in a circuit.

Let us look once more at part *b* of Fig. 8. When the stopcock is opened water will flow from tank *A* to tank *B*. The amount of water that will flow in a given time depends upon the area of the pipe which connects tank *A* with tank *B*. The water that flows through this pipe represents the current flow between the tanks. If you think of the difference of pressure between the tanks as voltage and the water flowing through the connecting pipe as current, you will have a good idea as to what takes place in an electrical circuit.

The unit of measure that tells us how much electrical pressure is present in a circuit is called a "volt" in honor of an Italian scientist. The unit for measuring volume of current is called the "ampere" or "amp" in honor of a French scientist.

What is Resistance?

Very important in electrical theory is still another factor called "resistance." Again we refer you to Fig. 8. Look carefully at the pipe which connects tank *A* with tank *B*. When a difference of pressure exists between these tanks a water current will flow through the connecting pipe. If the diameter of this pipe were increased, it is apparent that more water would flow through it in a given time, and if the diameter were decreased it is equally apparent that less water would flow in the same time. We would then say that the larger pipe offered less resistance to the flow of water than

the smaller one. In electricity the same reasoning holds true.

If two wires of the same material and length but of different diameters were compared it would be found that the one having the larger diameter would contain the least resistance. The resistance of a wire also depends upon the length. If two wires having the same diameters but different lengths were compared it would be found that the longer wire had the greatest resistance, assuming all the while that these wires were made of the same material.

Another determining factor is the material from which the wire is made. For example, a wire made from silver would have a lower resistance than a wire made from copper, and the copper wire would have less resistance than a similar wire made from iron. Temperature also affects the resistance of wire. Most resistance materials have what is known as a positive temperature coefficient, which means that their resistance will increase with increasing temperatures. One exception is carbon; its resistance will decrease with increasing temperature.

Resistance, like the other two quantities already mentioned, must have some unit of measure which tells us its magnitude. This unit is called the ohm, and was named for a German scientist, Georg Ohm. It is the resistance offered to an electrical current by a uniform column of mercury, 106 centimeters long, and having a cross-section area of one square millimeter at 0 degrees Centigrade.

Compounds and Mixtures

In answering the question, "What are atoms, molecules and electrons?" in the May issue of IP, this column loosely referred to air, brass and steel as compounds. This is not so because, in a chemical sense, all of these substances are mixtures. Air is a mixture of nitrogen, oxygen, argon, carbon dioxide, neon and small amounts of other substances. Brass is a metallic mixture (alloy) of copper and zinc. Steel is a mixture of iron and carbides of iron. Also, air does not contain hydrogen.

Crackdown on TV Advertising

An important first step has been taken in ridding the airwaves of fraudulent advertising sent out over television and radio channels. In Brooklyn, N. Y., a special police contingent was set up recently to monitor broadcasts on a battery of nine TV receivers and thirteen radios. Tape recorders are used to record questionable programs.

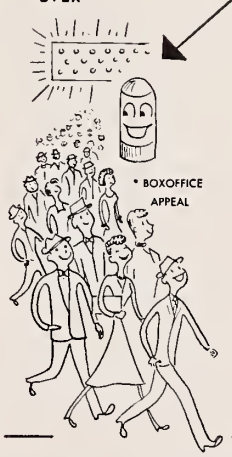
District Attorney Edward S. Silver declared that "pitchmen" have been deceiving many families, particularly those in low-income groups, with gaudy promises of bargains that turn out to be very costly once a contract is signed.



more B.A.*

*(BOXOFFICE APPEAL)

MOVIES ARE BETTER THAN EVER



with SUPER-SNAPLITE f/1.7 projection lenses

● GREATER LIGHT ● GREATER CONTRAST ● GREATER SHARPNESS

Watch your "B.A." climb when you install Super Snaplite Lenses. Give your patrons the benefit of pictures at their best. You can't beat the Super Snaplite f/1.7 when it comes to putting a clear, sharp picture on your screen.

Ask your Theatre Supply Dealer about these fine lenses. For more information ask your dealer or write for Bulletin 222.

"You Get More Light with Super Snaplite"

KOLLMORGEN Optical CORPORATION
NORTHAMPTON, MASSACHUSETTS

How Old Is the Wide-Screen Idea?

Much older than you think, says the following article reprinted through the courtesy of "Films in Review."

By JAMES L. LIMBACHER

IF THERE were to be a birthday party celebrating the advent of widescreen motion pictures, how many candles would be atop the cake? Two? Ten?

No, fifty-nine.

Like any new invention, motion-picture film was not at first standardized. William Friese-Greene's first movies were huge strips of celluloid; Pathé's film was 28 millimeters wide; the width of Biograph and Mutoscope's was 2.75 inches; and the Lumiere brothers' film had only one sprocket hole per frame. Thomas A. Edison made his movies on 35-mm, with four perforations per frame near each edge of the film.

Chiefly because Edison sold more motion-picture equipment than anyone else, his film size and his screen size—4 x 3—became the worldwide standard. Also, we must remember that the early motion pictures were exhibited not in theatres but in stores, which were long and narrow. If movies had first been shown in theatres, the natural tendency would have been to make the image as wide as the theatre stage.

First Circular Screen

The first widescreen process dates back to 1896 when Raoul Grimoin-Sancon presented Cineorama, which consisted of ten projectors throwing ten images on a huge circular screen. Cineorama was later shown at the Paris Exposition, along with a wide-screen presentation by the Lumiere brothers on a screen 48 feet high and 53 feet wide.

Americans first saw widescreen movies in the travelogs of Lyman H. Howe, who shot his films with a short focal-length lens. The resulting pictures tended to envelop the audience and to induce an illusion of the audience being part of the action.

Professor J. Louis Peck of France demonstrated a huge curved screen at the New York Rivoli in 1920 with scenes from Paramount's *Everywoman*. The critics were excited about the good focus and "the absence of eyestrain."

In 1921 George W. Bingham exhibited a wide-angle projection system he called Widescope, consisting of two films projected side by side and giving a double-width image.

In the middle '20s the Germans introduced a 42-mm film called Tri-Ergon, which had a premiere at the New York Cameo.

Lorenzo del Riccio launched his Magnascope process in 1925 and it had more longetivity than any previous process. A special lens gradually "blew up" the film image to four times its regular size. The effect was spectacular and usually was reserved for the climax of the picture. The Magnascope lens was first used for the battle scenes in *The Big Parade*, and later in the climaxes of *Old Ironsides*, *North of '36*, *The Thundering Herd*, *Chang*, *Twinkletoes*, *The Iron Horse* and *Wings*. It experienced a 1948 revival in Selznick's *Portrait of Jenny*, and again in 1952 in his *The Wild Heart* (at the New York Paramount).

Natural Vision, promoted by the late George K. Spoor and P. Berggren, used 70-mm film and was projected on two screens so arranged one behind the other as to give a stereoscopic, widescreen effect. *The American*, starring Bessie Love and Charles Ray, was shown in Natural Vision. In 1929, sans stereoscopic effect, it reappeared as Fox's Grandeur process.

Why Grandeur Failed

But for the arrival of sound, Grandeur might have become the new standard width for movies. However, theatre owners were spending too much money wiring their theatres for sound, and could not afford to buy projectors that handle 70-mm film. After three Grandeur films, *Fox Movietone Follies of 1929*, *Happy Days* and *The Big Trail*, Grandeur disappeared. Twentieth Century-Fox repeatedly announced they would revive it in "roadshow" presentations.

Several other wide-film processes appeared simultaneously with the arrival of sound: Paramount's Magni-film (56-mm film) was used for *You're in the Army Now* in 1929; MGM's Realife (65-mm) for King Vidor's *Billy the Kid* in 1930; and Warner Brothers' 65-mm-film for *Kismet* in 1930 and *The Lash* in 1931.

In France, Claude Autant-Lara and Abel Grance had introduced the "triptych screen" — three regular-sized screens, on the outer two of which were shown scenes supplementing the image in the middle. Autant-Lara used the process for *Pour Construire un Feu* (1925), and Gance for his monumental *Napoleon* (1927).

A more radical departure was the process developed in 1928 by George Hill and an Italian, Professor Alberini, recently reported in *Films in Review* (October 1954). Its basic difference was that the film was shot and projected horizontally. Although impractical then, the idea reappeared 25 years later as Glamorama, and even more recently as VistaVision.

Exhibitors Protested

After all these systems had run their course, Adolph Zukor of Paramount, speaking for the Producers Association of America, assured exhibitors they would be burdened with no more wide films. By mutual consent, the producers had called a halt.

But experimentation continued. At the World's Fair in New York in 1939 the late Fred Waller presented Vitarama, which used 11 projectors strapped together to project an image on a curved screen surmounted by a quarter dome. Although Vitarama excited those who saw it, it was impractical for theatrical use. Or was it? Vitarama, without the dome, and with refinements, and only three projectors, emerged in 1952 as Cinerama!

The success of Cinerama, the reintroduction of 3-D, and the competition of tiny-screen tv, made widescreen images on one film the great desideratum. The answer was "anamorphosis", the principle of which was patented as early as 1862 and demonstrated as early as 1898. When Dr. Sidney Newcomer projected his "squeezed" films in 1930 the film industry was not interested.

When Professor Henry Chrétien demonstrated a similar system a year later, Paramount optioned but did nothing with it. In 1937 Chrétien exhibited his anamorphic system at the Paris Exhibition, but it mas not until 1952 that Spyros Skouras of Twentieth

Century-Fox took it up and renamed it CinemaScope.

CinemaScope's success is history, but it has not been, and is not, without its challengers. Other anamorphic systems include Warner-SuperScope, developed by Zeiss-Opton in Germany for Warners; Vistarama, developed by the Simpson Optical Company for Carl Dudley; Cinepanoramic, developed in France; CameraScope, the English version of Cinepanoramic; SuperScope, invented by the Tushinsky Brothers for RKO; Vidoscope, developed and sold by Walter Futter; and Delrama in Holland. All are compatible with CinemaScope and, with the exception of SuperScope, which has a 2:1 aspect ratio, are the same basic process as CinemaScope.

Todd-AO Enters Field

The Todd-AO process, using 70-mm film, has entered the wide-screen race with a roadshowing of *Oklahoma.* VistaVision, using images photographed horizontally on double frames reduced optically to 35-mm images, or, in large theaters, projected horizontally, was introduced late in 1954 in *White Christmas* by Paramount, which has completely converted to horizontal double-frame photography.

Other large film processes include MGM's Panavision (65-mm), Twentieth Century-Fox's 55-mm film, and Camerama. Other widescreen systems which should be mentioned for the record are Superama, Sonoptic, Plastorama, Polyvision, AMP-O-Vision, Photorama, Perfect Tone, Scenic Scope, Paravision and Metrovision.

National Theatres' Cine-Miracle process is similar to that of Cinerama in that it uses three films and three projectors.

Walt Disney's Circarama completes the cycle of widescreen processes. It consists of 11 images projected on a circular screen, and this, basically, is the Cineorama process of 1896.

It is possible but not likely that widescreen standardization will come in 1956. The contenders most likely to be victorious are CinemaScope and VistaVision. But wait—someone has just announced a 42-mm film which has an aspect ratio of 3:1—which is larger than even Cinerama's projection ratio. I wonder. . . .

YOUR BEST BUY
U. S. SAVINGS BONDS



PRIME PROJECTION LENSES

Actual theater tests over the past year have proven Super-Hilux vastly superior to any other prime projection lens. The increased over-all light distribution shown in comparison with other models was amazing! In fact, in one theater using a 4″ diameter lens, there was a *gain on the sides of over 20%* with our 5.5″ Super-Hilux!

For more proof of Super-Hilux superiority . . . or a free comparison test in your own theater, write us, Dept. P-76.

PROJECTION OPTICS
PROJECTION OPTICS CO., INC.
Rochester, N.Y. London, England

PERSONAL NOTES

J. A. FETHERSTON, sales manager of Kollmorgen Optical Corp., announced his retirement following many years' association with the motion picture equipment industry. Fetherston will still serve Kollmorgen on a consulting basis and will continue to contact theatre equipment dealers on special field sales and service problems. His address is 11 Plymouth Road, Port Washington, N.Y. Succeeding Fetherston as sales manager is WILLIAM C. O'DONNELL, who will operate out of Kollmorgen headquarters in Northhampton, Mass.

* * *

ARTHUR J. HATCH has been elected president and member of the board of directors of the Strong Electric Corp., Toledo, Ohio, a subsidiary of General Precision Equipment Corp. Hatch joined the engineering staff of Strong in 1935, and has been vice-president since 1947. He is a Fellow of the SMPTE and a member of the screen brightness committee. As chairman of the advertising



Arthur J. Hatch

committee, he is also active in TESMA. In addition, Hatch maintains participating memberships in the Illumination Engineering Society and the Technical Association of the Graphic Arts Industry. Over the years, Hatch has contributed many articles to the pages of IP.

As president, he replaces the late Harry H. Strong, founder of the company. The Strong Electric Corp. is an important manufacturer of arc lighting equipment.

* * *

G. J. HESSICK has been appointed manager of the Los Angeles branch of National Theatre Supply. He succeeds M. B. Smith who resigned recently. Hessick joined NTS in 1941 and since then has served continuously in a variety of capacities.

* * *

CHARLES S. STODTER has been appointed executive secretary of the SMPTE. Stodter comes to the SMPTE from the Institute for Cooperative Research of the University of Pennsylvania where he served since 1954 as senior research investigator engaged in communication



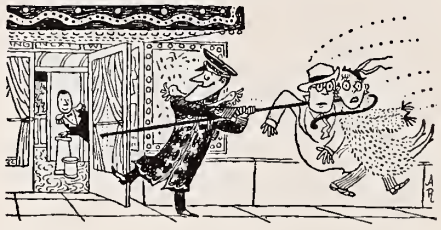
Charles S. Stodter

system studies for advanced military weapons systems. Previously he was in the U.S. Army for 30 years, rising to the rank of Colonel while holding such positions as: chief of the Army Pictorial Service in Washington, D.C., from 1950-1954; commanding officer of the Signal Corps Pictorial Center, Long Island City, N.Y., from 1948-1950; and commander of the Signal Corps Still and Motion

Your decor may dazzle 'em...



Your house-front may invite 'em...

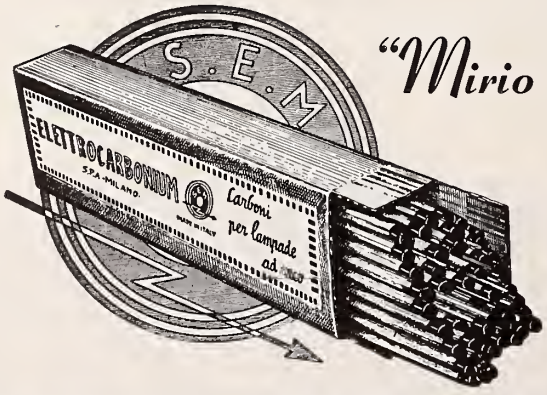


BUT EVERY PERFORMANCE STILL MUST BE PERFECT!

Perfect performances require equipment that's right on the ball through every foot of film. Things are always ready to roll when you deal with an expert RCA Theatre Service Engineer. *Nobody* else has that vital support from all RCA's technical resources.

RCA SERVICE COMPANY, INC.
A Radio Corporation of America Subsidiary — Camden, N. J.

"Mirio"



ELETTROCARBONIUM
VIA BORGHETTO. 5 — MILANO (Italy)

Picture Laboratories in Washington. Through all these capacities, Stodter has acquired an extensive working knowledge of motion picture production, projection, and distribution, as well as important experience in television activities. Stodter took over his new duties early this month, succeeding Boyce Nemec, who recently resigned to become a management consultant specializing in the motion picture business.

* * *

MILES A. GOLDRICK, formerly Westrex's supervisor of activities in the Far East with headquarters in Hong Kong, has been transferred to the corporation's Hollywood division as administrator of public relations.

OBITUARIES

HARTNETT, WILLIAM H., 60, business representative of IA Locals 95 and 257, Ottawa, Ont., Canada, died June 21 after an illness of many months. At the time of his death he was serving his 30th consecutive term as business representative for Local 257, and his 10th term for the Stagehands Local. Born and educated in Ottawa, Hartnett began his career in show business as a lad of 13, when he distributed handbills and collected laundry from the stars at the old Russell Theatre in that city. Later he became a "prop" boy, graduating to the role of usher and eventually to walk-on parts as a "super."

He was chief projectionist in the Ottawa district for Famous Players Canadian Corp., and several years ago became a member of the Famous Players 25-Year Club. He had a wide acquaintance in IA circles, having represented his Local at many International and District conventions. Survivors are his widow, a son, one brother, and two sisters.

• • •

LOAKES, FRED J., 55, charter member of Local 165, Hollywood, Calif., died June 7 following a cerebral hemorrhage. He was chief projectionist at the Walt Disney studio for the past 13 years. He is survived by his widow and two sons.

• • •

AMBERSON, JOHN TEE, 70, charter member of Local 236, Birmingham, Ala., was stricken with a fatal heart attack in the projection room of the Empire Theatre there, where he had worked for the past 25 years.

• • •

WEISS, ALEXANDER, 68, member of Cleveland Local 160, died June first after an illness of several years. He worked as projectionist at the State Theatre there for many years prior to his illness.



WHEN YOU BUY...

Buy Simplex

T. M. REG. U. S. PAT. OFF.

Your SIMPLEX Projector Mechanism represents a priceless investment. You bought it after long, careful study because you recognized it as the finest projector on the market.

Don't take chances with such an investment — *the very success of your theatre* depends upon its performance! When spare parts are necessary, insist on the best — insist on *SIMPLEX* parts!

From the smallest stud pin to the largest gear cover, every part is made with the same precision and skill as the mechanism itself. By using *only* SIMPLEX parts, you can be certain of maintaining the high quality of performance that has made SIMPLEX the world's foremost projector mechanism!

Genuine SIMPLEX parts are available only through

N.T.S

Your Guarantee

of Consistent Quality and Outstanding Service

NATIONAL THEATRE SUPPLY • 29 BRANCHES COAST-TO-COAST

SCREENS, APERTURES AND ASPECT RATIOS

(*Continued from page* 10)

1.65/1 ratio for regular, non-anamorphic prints gives rise to technical problems of film waste due to overly thick framelines, overworked projector intermittents, heating of the film by the arc lamp, and the number of frames per second needed to provide smooth, flicker-free projection at the highest light levels. As previously stated, the conventional 1.375/1 a.r. results in a waste, due to frameline thickness, of 15% of the total length of the film, while the 1.65/1 a.r. wastes fully 25%.

The waste of film footage caused by the unused frameline areas is reduced in CinemaScope projection by the comparatively large apertures. CinemaScope framelines, being relatively thin, result in only 3.5% of unshown film length. The larger picture areas of CinemaScope films increase image definition and improve the focusing characteristics (depth of focus) of the projection lens.

3-Perforation Pulldown

By employing an intermittent pulldown of 3, instead of the standard 4, perforations per frame of film, the resulting filmshift distance of 9/16 inch (0.5625″) is enough to accommodate the 1.65/1 a.r. projector aperture (0.825″ x 0.500″) and permit the use of a necessarily larger camera, or printer, aperture (proposed dimensions: 0.87″ x 0.55″). These dimensions result in an unused film-length in the camera of only 1.25%, and in the projector of only 6.25%. These figures compare favorably with the unused-length percentages in silent-film standardization, namely, 3% in the camera, 7.05% in the projector.

Figure 5 is a side-by-side visual comparison of standard non-anamorphic release print and the proposed "3-hole" release print intended to be shown in aspect ratios of 1.65/1 and greater. Note that the 1.65/1 (or 1.66/1) a.r. projector aperture now in use for 4-hole film is to be used for 3-hole film. *The picture area is NOT reduced by reducing the thickness of the framelines!*

A number of projection technologists have advocated the 3-hole frame shift for 35-mm film. There is nothing new in the proposal. It is worthy of serious consideration, however, first because of the necessity to restandardize the a.r. of normal-film projection, and secondly because the 3-hole pulldown offers several distinct advantages in addition to utilization of practically all of the picture area of the film.

More Frames Per Second

There are 16 frames per foot on standard 4-hole film. On 3-hole film there are 21⅓ frames per foot, or 64 frames per 3 feet. If the present 24 frames per-second rate of exposure is kept, 3-hole film will travel only ¾ as fast as 4-hole film, with a running time per reel 1⅓ times that of present film. Instead of 1½ feet per second (90 feet per minute), the travel rate of 4-hole film, the 24 frame/sec. 3-hole film will run at the rate of 1⅛ feet per second (67½ feet per minute).

If, on the other hand, the linear running rate and showing time per reel is preserved in 3-hole film, the frame rate will be increased from 24 to 32 frames per second. The more rapid frame rate will result in a field rate on the screen of 64 exposures per second when regular 2-cutoff projector shutters are used. Projected pictures are virtually flickerless, regardless of light level, at 64 exposures per second.

Yet another alternative exists, and one which is apt to be of greater interest to television engineers than to theatre-movie technologists. "If the frame rate of professional film is increased," argue the TV people, "it should be changed to 30 frames per second, the exact submultiple of the American TV field rate of 60 interlaced scannings per second."

Let's see how the 30 frame/sec. rate affects running time and film consumption in the case of 3-hole film. It will change the travel rate from the present 1½ ft./sec. (90 ft./min.) to 1$\frac{13}{32}$ ft./sec. (84⅜ feet./min.). Therefore, 30 frame/sec. 3-hole film will run $\frac{15}{16}$ as fast as 24 frame/sec. 4-hole film, and the running time per reel will be 1-1/15 that of present film.

The principal disadvantage of 3-hole film standardization is the non-interchangeability with present-day 4-hole CinemaScope prints. The anamorphic process could be readily adapted to 3-hole film, however; and by utilizing the whole 0.825″ x 0.500″ projector aperture and an anamorphic expansion factor of 1½, very high quality images in an aspect ratio of 2.475/1 would be obtained. (As an alternative, and with a slight sacrifice of picture quality and brightness, two 0.1-inch strips could be subtracted from the frame width for 3-channel stereophonic sound, leaving a projector aperture measuring 0.625″ x 0.500″, which, with an anamorphic expansion factor of 2, would result in a 2.5/1 a.r. picture.)

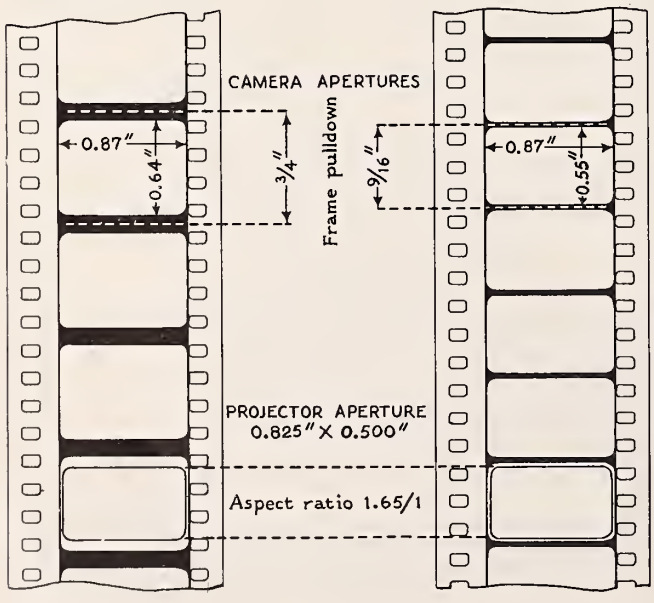


FIG. 5. Printing differences in 4-hole and 3-hole frame placement. Note that *the same* 1.66/1 (or 1.65/1) a. r. wide-screen aperture is used with both kinds of projection print. Higher aspect ratios may, of course, be used with the 3-hole frame shift.

Present Speed Favored

Retention of the 24 frame/sec. rate is favored for 3-hole film prints. The advantages of this standard rate are fivefold. (1) Studio camera apparatus need not be altered. (2) Old pictures

(*Continued on page* 34)

TECHNICAL VIEWPOINT

(*Continued from page* 15)

Scotchlite, and other lenticulated screens.

The term "lenticulated" is also applied to aluminum screens having pebbled, embossed, or corrugated surfaces for better light distribution throughout relatively wide angles of viewing. The Manco-Vision sheet aluminum corrugated screen for drive-ins, for example, makes use of this principle for even distribution of light over a wide viewing area. Screens with embossed aluminum surfaces accomplish the same thing for indoor theatres.

Beaded and resin-grain screens are extremely directional. For this reason they should not be used in wide theatres or in theatres having steep projection angles. True, the white backing supplies a modicum of illumination to the side viewing areas; but it has been found that the difference between side and central viewing conditions is too great to be tolerated except in the case of powdered-glass lenticulated screens. These have good reflecting characteristics and are much less directional than the beaded and resin-grain types.

Some projectionists may have noticed that very large and very small numbers are often written "exponentially" in technical articles, and find this confusing. For instance, how are numbers such as 7.3×10^{8} and 52.4×10^{-6} interpreted?

The positive or negative "exponent" applied to the common "base" of 10 indicates how many places the decimal point in the "factor" is to be shifted to the right or to the left. Exponential notation ceases to be confusing when you remember that large numbers have positive exponents, and small numbers have negative exponents.

The *positive* exponent "8" in 7.3×10^{8} means that the decimal point in 7.3 is to be shifted 8 places *to the right.*

$7.3 \times 10^{8} = 730{,}000{,}000.$

The *negative* exponent "-6" in 52.4×10^{-6} means that the decimal point in 52.4 is to be shifted 6 places *to the left.*

$52.4 \times 10^{-6} = 0.0000524.$

This is certainly not a problem that will come up in practice so far as most of us are concerned, but it is possible for a projected picture to be *too bright.*

Theatre-release prints are controlled in density to give satisfactory rendition of color and photographic tones at light levels of from 9 or 10 to 14 or 15 foot-lamberts as measured at the center of the screen with the projector running,

PROTECT
YOUR PROFITS
with this
PERFECT-PICTURE
PRIME
LENS

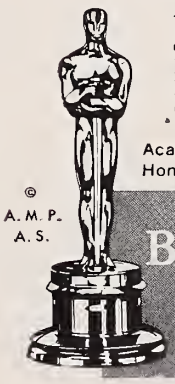


Bausch & Lomb
SUPER CINEPHOR
Projection Lenses

Today's great new movies and exciting film techniques are pulling audiences out of the home and into your theatre. Your profits depend on keeping them eager to come back for more. Make *sure* . . . with the *only* prime lens that transmits *all* the brilliance, color and vivid detail to your screen. Prime up *right* with B&L Super Cinephor Lenses, for today's most faithful screen rendition of all 35mm releases.

SEE THE BIG DIFFERENCE . . . FREE DEMONSTRATION

Write, wire or phone for Catalog E-123 and for free demonstration. (Indicate dealer preference, if any.) Bausch & Lomb Optical Co., 61607 St. Paul Street, Rochester 2, N. Y. Phone: LOcust 3000. (In Canada, General Theatre Supply Co., Ltd., Toronto.)



Academy of Motion Picture Arts and Sciences
Honorary Award for Optical Service to the Industry

BAUSCH & LOMB
SINCE B&L 1853

but without film. Experience amply demonstrates, however, that screen brightness may be as high as 20 foot-lamberts in the "satisfactory-brightness range." This is especially true when ambient auditorium illumination is in the neighborhood of 1 or 2 foot-lamberts.

Color prints of the inbibition type ("old" Technicolor) should be projected at the same light levels as black-and-white prints, but multilayer dye-coupler films (Eastman Color) theoretically require 120% the illumination of B & W prints for the best visual reproduction. Accordingly, the satisfactory brightness range is 10 to 20 foot-lamberts for monochrome and 12 to 24 foot-lamberts for multilayer color film.

When screen brightness exceeds 40 or 50 foot-lamberts, however, the darker tones in the projected pictures are "degraded" into grays that do not follow the same densitometric curve as the medium tones and highlights. This imparts an unnatural appearance to the regions of shadow in the pictures and "washes-out" low-key scenes.

In addition, the 48-cycle flicker generated by the projector shutter becomes more pronounced as brightness is increased, with the result that clouds, snow, white buildings, etc., flicker intolerably at excessively high light levels.

Four New Drive-Ins

Latest RCA theatre sound, projection, and accessory equipment is being installed in four of the nation's newest drive-in theatres now in the final stages of construction, according to A. J. Platt, manager of theatre equipment sales at RCA. The drive-ins are located in Bengies, Md.; Exton, Pa.; Colorado Springs, Colo.; and Lakeville, N. Y. Equipment for the new drive-ins include RCA-200 projectors, in-car speakers, Dyna-Heat in-car heaters, Dyn-Arc lamp systems, rectifiers, and screen towers. All four drive-ins begin operations this summer.

WIDE-ANGLE PROJECTION

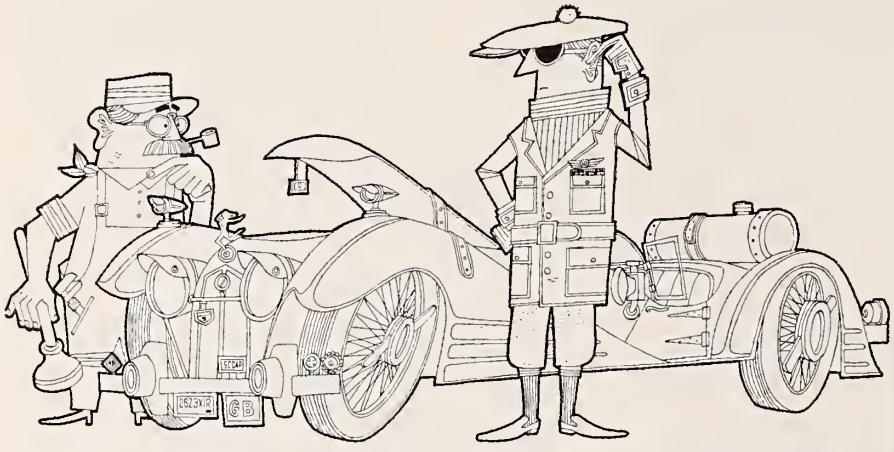
(*Continued from page* 17)

again runs true but the other lines are displaced off the vertical more and more as they approach the edge of the frame.

Once again the wider our angle of field the more pronounced this will be. There is another distortion present in some systems which further affects verticals as they approach the extreme edge of the frame: the bending of lines —even when the camera is not tilted— due to barrel distortion inherent in many extreme wide-angle setups. Cinerama does not have this as the optics of this system are those of a simple 27-mm lens. Todd-AO has it to a great extent but corrects it in the optical printing step. All other wide-screen systems have it in varying degrees.

As can be imagined, these two distortions—particularly when combined —make the problem of verticals even more troublesome than we have seen with the horizontals. There is little to be done about them except the obvious: keep pronounced verticals out of the extremes of the frame either by blocking them off or by changing the setup. Fortunately the extent of the problem —and usually its solution—can be seen on the ground glass of the camera finder. The eye is easily offended by bent buildings, etc., so as a general rule any verticals at the extremes of the frame should be studied with suspicion.

Long before the wide screen was



YOU WOULDN'T LET A PLUMBER TINKER WITH YOUR CAR!

Your car plays a vital part in the life of you and your family. You wouldn't dream of letting a plumber tinker with it.

So, too, your sound equipment is the most important property in your theatre.

It deserves the expert technical attention only ALTEC can give it. 6,000 satisfied ALTEC SERVICE customers have learned this.

HOW ABOUT YOU?

ALTEC® SERVICE CORPORATION

SPECIALISTS IN MOTION PICTURE SOUND

161 Sixth Avenue • New York 13, New York

Your Best Buy — U. S. Savings Bonds

Clayton Ball-Bearing Even Tension Take-Ups

For all Projectors and Sound Equipments

ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS. SILENT CHAIN DRIVE

THE CLAYTON REWINDER

FOR PERFECT REWINDING ON 2000-FOOT REELS.

CLAYTON PRODUCTS CO.

31-45 Tibbett Avenue New York 63, N. Y.

thought of, cameramen were familiar with the "pulled out" effect of wide-angle lenses. A small round object photographed in the center of a screen will still appear round; but if it is moved toward the edge of the field it is pulled sideways—out of shape. This, of course, is due to the fact that at the sides of the field the image is hitting the film at an angle. As we get into wider and wider lens angles this effect becomes even more pronounced. Cinerama has very little of this problem (considering the angle it covers) since it is using three strips of film, which are perpendicular to the axis of the lenses.

Todd-AO also has very little of this distortion since American Optical Company has introduced compensating distortion into Todd-AO lenses to counteract it. With other wide screen systems the distortion is very evident. It is from this we get our old adage about not making closeups or panning with wide-angle lenses. As the lenses keep getting wider this certainly holds more than ever. However, there are certain situations where we have found it possible to pan even with the most extreme wide-angle lens.

Speed Conceals Distortion

Where there are pronounced horizontal lines low or high in the screen, a normal pan from a stationary camera position is certainly not desirable as it will call attention to a bent line that may have been unnoticed before. A street may curve, but if the curve keeps changing as it goes across the screen, you are asking a lot of the credulity of your audience. Even without any pronounced geometry in the scene the "pulling out" of objects and their resultant increase in their speed of travel at the edges of the frame will be disturbing. However, in a fast pan, or a pan following some object, such distortions will probably go unnoticed.

Take the familiar scene in which an actor must walk down a street past the camera; the camera panning with him. If he walks far enough away from the camera to remain full figure all the time, the audience will have plenty of time to watch those lines bend their way tortuously through the picture. If, however, the actor is allowed to walk close to the camera, the increased screen size of his body will block off and break up the distorted lines, and the increased speed of the pan will not permit time for the distortions to be observed.

In most situations, even a slow pan will be quite acceptable if it is made while the camera is moving. With the camera in motion the "pulled out" effect described before is already present and is actually a factor that heightens the feeling of movement; and any distortion of lines is usually lost in the forward motion. For these reasons, in making running or dolly shots with wide-angle lenses, the distortions are practically never noticed (with the possible exception of moving with the camera shooting straight to the side) particularly when moving with the subject.

This is fortunate, for it is in movement that these lenses can be used to great effect. The increase of speed of people or objects moving through the sides of the screen approaches the effect our eyes actually see and gives us a truer feeling of motion. This effect is even more pronounced if we are in a crowded or confined space—the shot moving through the narrow alley in "Summertime," or the shot moving through the cornfield in "Oklahoma."

Audience "Participation"

Beside the advantages of the extreme wide-angles in movement it has the further advantage of giving us the opportunity to put the audience into the action. Besides photographing straight ahead these lenses are shooting to a considerable extent to the side. By moving in close to the action with an extreme wide-angle lens we do considerably more than show the audience a picture of a specific action. In effect, we surround them with the action.

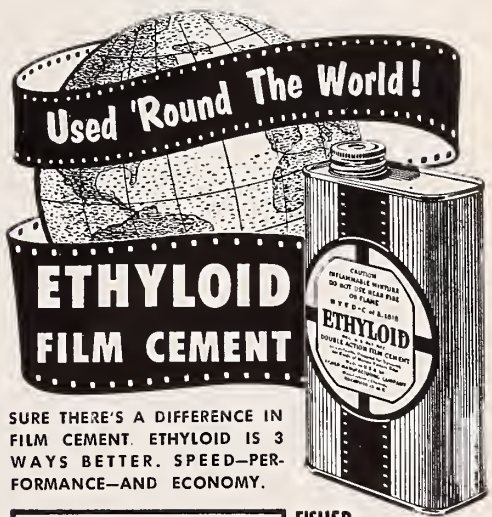
A good example of this is the New Orleans jazz sequence, and the art students' ball sequence in "Cinerama Holiday." The audience is caught up in the action and excitement in a way that could only be achieved when a wide-angle lens is joined with wide-screen.

In many cases the wide-angle is the lens "in the bottom of the box"—brought out only when lack of space forces its use. Greater understanding of its virtues and limitations can do much to increase its effectiveness in wide-screen photography.



Are You Moving?

If so, please notify us one month in advance. The Post Office does not forward magazines. To avoid delay, please cooperate by sending us both your *new* and your *old* address.



SURE THERE'S A DIFFERENCE IN FILM CEMENT. ETHYLOID IS 3 WAYS BETTER. SPEED—PERFORMANCE—AND ECONOMY.

AVAILABLE AT ALL THEATRE SUPPLY DEALERS

FISHER MANUFACTURING CO.
1185 Mt. Read Blvd.
Rochester 6, N. Y.

Lorraine ORLUX SUPER-CHARGED LARGE-CORED Carbons
For DRIVE-INS & THEATRES with HUGE, WIDE-AREA SCREENS • CARBONS, Inc. BOONTON, N.J.

SPLICES NOT HOLDING ?

Film breaks are costly. Play safe by using

JEFRONA

All-purpose CEMENT

Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.

CAMERA EQUIPMENT CO.
DEPT. J-7-8
315 West 43rd Street New York 36, N. Y.
JUdson 6-1420

SCREENS, APERTURES AND ASPECT RATIOS

(*Continued from page* 30)

may be reshown in theatres by merely reprinting the 4-hole picture negatives at 1.65/1 a.r. on 3-hole master positives and re-recording the 90 ft./min. sound masters at 67½ ft./min. (3) A 1⅓ increase in running time and saving of film and raw-stock costs. (4) Longer useful film life, less wear on hard-working projector intermittents, and less film noise in the projection room. (5) The films can be shown on TV by the present-day 2-3-2 method of pulldown timing.

The single disadvantage of 24 frame/sec. 3-hole film is the effect of the lower linear rate on sound reproduction. Unless the scanning beam of recording apparatus be narrowed to ¾ of its present width, the highest frequency recordable in optical sound will be reduced from 12,000 cycles to 9,000 cycles. This difficulty is easily overcome; and as far as projector soundheads are concerned, it will be necessary only to restore the old 1-mil scanning-beam standard (specifically 0.9375 mil instead of the present 1.25 mil). The lower film speed will compensate for the increase in ground noise due to emulsion grains.

A slight attenuation in the high-frequency range, however, is not serious. In fact, attenuation of the 7,000—10,000 cycle range by the speaker system is always appreciable, and in most cases desirable even when the optical-track soundheads reproduce frequencies as high as 10,000-12,000 cycles. Too high a "top-cut" has the bad effect of increasing ground noise.

Even 16-mm sound film running at 0.4 the speed of standard 35-mm film is quite capable of providing satisfactory sound up to about 8,000 cycles without appreciable ground noise at ordinary levels of volume.

Less Heat on Film

As for the more rapid frame rates proposed for 3-hole film, their advantages lie chiefly in the direction of flickerless pictures and less heating of the emulsion by the arc-lamp beam. In fact, 48 frames-per-second prints made from 24 frame/sec. negatives might be very serviceable in drive-in theatres to prevent blistering of the emulsion.

The changes needed in 35-mm projection equipment for running 3-hole film are not extensive. Old-style projectors can "get by" with nothing more than a substitution of 12-tooth sprockets for the regular 16-tooth sprockets (with corresponding readjustment of the pad rollers and gate-door intermittent-sprocket shoe); but this simple method should not be considered as a permanent expedient. Film-wrap around 12-tooth sprockets is not entirely satisfactory.

The ideal conversion of a projector to 3-hole film involves the substitution of a suitably geared intermitent movement employing an 18-tooth sprocket (six 3-hole frames per revolution) and reduction of motor-soundhead drive gearing to ¾ of the present standard RPM to allow use of present sprockets in mechanism and soundhead. The problem is a simple one from the point of view of the mechanical engineer.

[THE END]

Color Films on Decrease

The proportion of color films to all films made in 1955 dropped for the first time since color first became a factor in motion picture production. The Motion Picture Association of America announced that there were 154 color features last year, or 50.5% of a total of 305 pictures that received the Production Code Seal. In 1954, there were 176 color films, or 58.1%, an all-time high for the industry.

A major contributing cause to this downward trend has been the successes of such black-and-white films as "On the Waterfront," "From Here to Eternity," and more recently, "Marty." Aside from 20th-Fox, which has an unwavering policy of color CinemaScope, studios are carefully examining the dramatic potentialities of scripts before deciding on which medium to use.

Q: When is a mistake a blunder?

A: When a projectionist is not a regular subscriber to IP—a MUST reading for the projectionist craft.

Use the handy order form below

INTERNATIONAL PROJECTIONIST
19 West 44 St., New York 36, N. Y.

Enter my subscription for ☐ 1 year (12) issues—$2.50
☐ 2 years (24) issues—$4.00

Foreign and Canada: Add 50c per year

Name .....

Address .....

City ..... *Zone* ..... *State* .....

"Those poor devils are dying"



MUSTACHIOED, bulky and calm, Jack Philip stood on the bridge of the U.S.S. *Texas*, watching his gunners pour fire into the Spanish men-of-war fleeing Santiago harbor.

Only a few days before, another American ship had accidentally fired at the *Texas*. Philip had responded by signalling: "Thanks, good line, but a little over."

Now enemy shells were whistling over his head from desperate vessels doomed to destruction. As the *Texas* raced past the flaming, riddled *Vizcaya*, that Spanish battleship exploded.

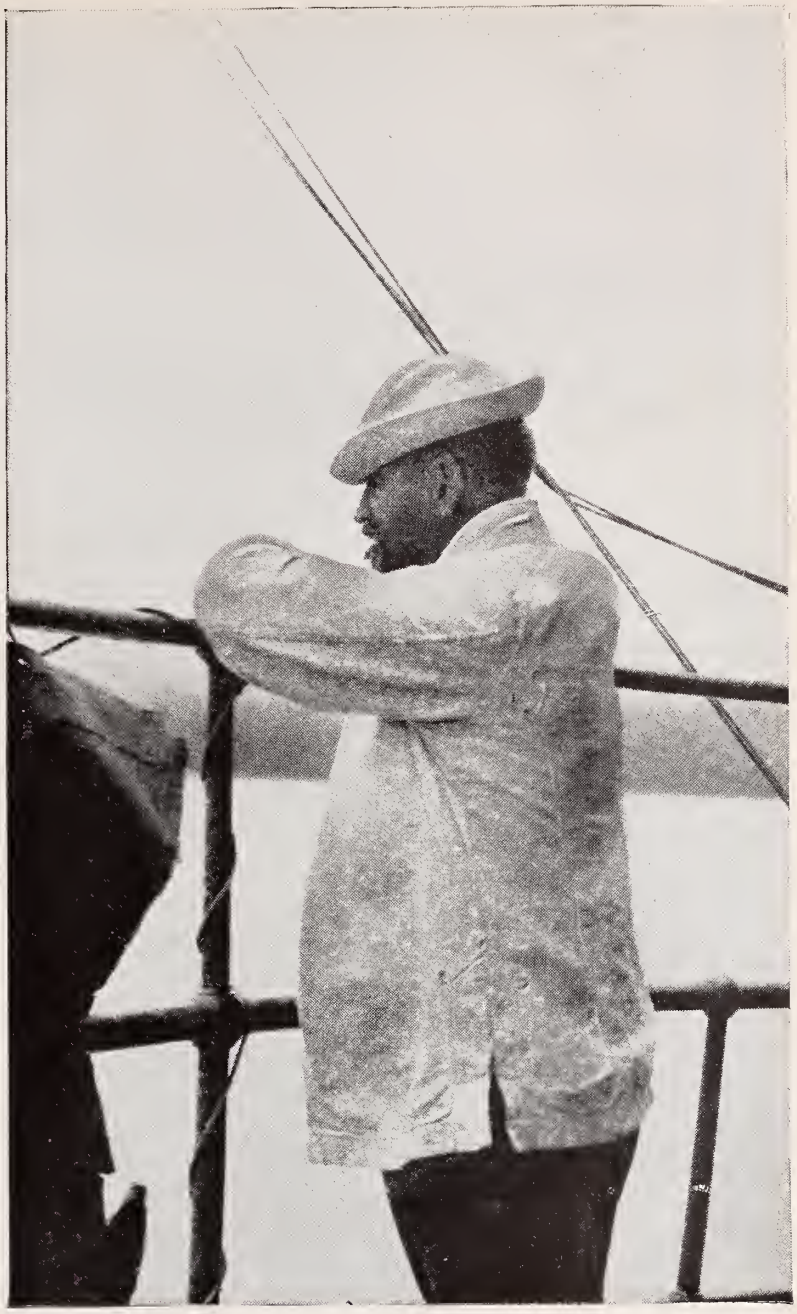
Instantly, a great victorious shout sprang up on the *Texas*. But Captain Philip quickly silenced it:

"*Don't cheer, men; those poor devils are dying.*"

A bold captain who ran a happy ship, Jack Philip was already something of a friendly hero to his men. But this one sentence, more than all his bravery, made him a hero of the Spanish-American War to millions of Americans.

For Americans prize gallantry. Gallantry is part of the great heritage — part of the strength — of the American people. And today, it is this strength — the strength of 165 million Americans — which forms the real guarantee behind one of the world's finest investments: United States Series E Savings Bonds.

That's why it's such a good idea for any American to buy Savings Bonds regularly and hold on to them. Start today!



★ ★ ★

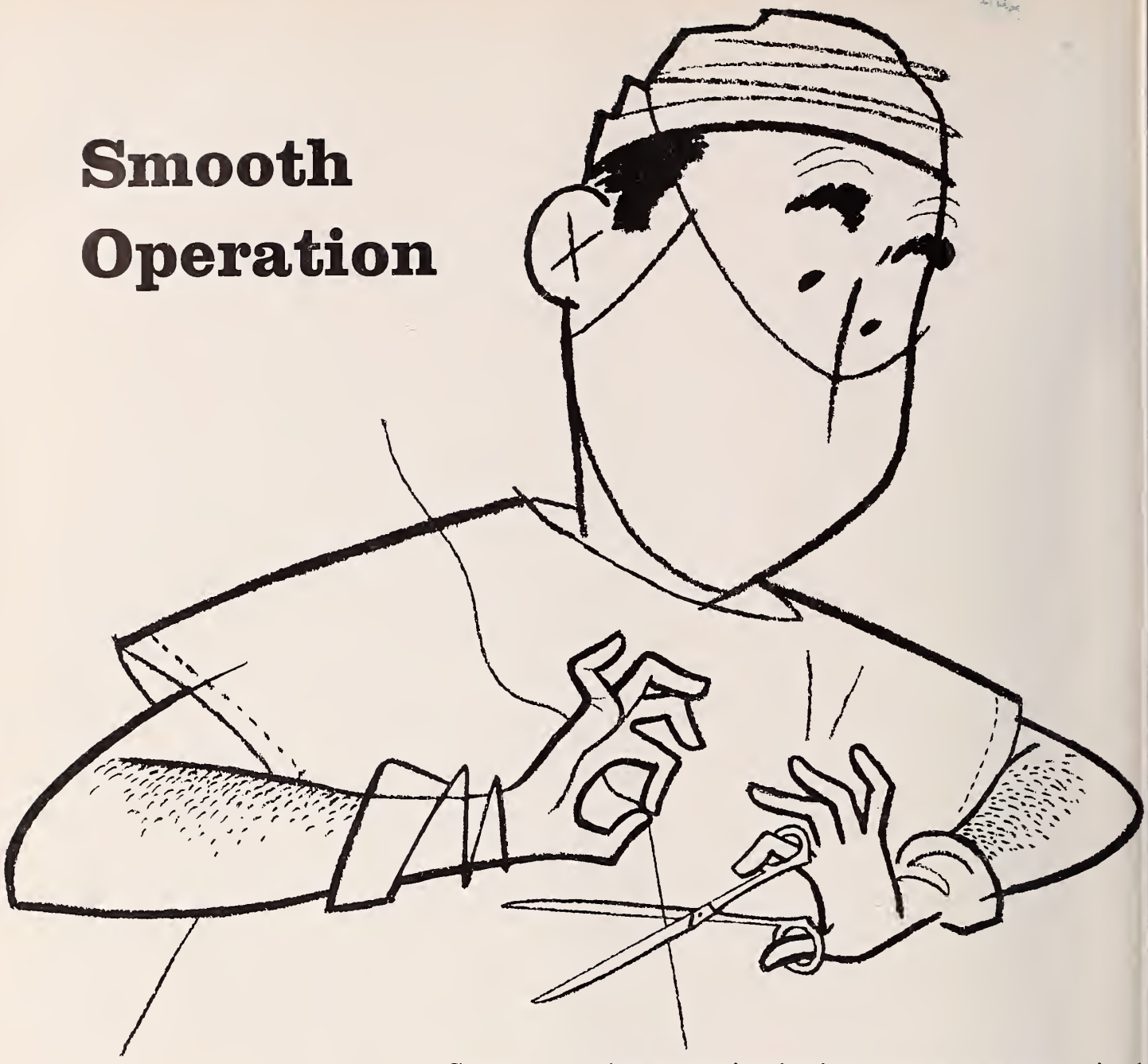
It's actually easy to save money—when you buy Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done *for* you. The Bonds you receive will pay you interest at the rate of 3% per year, compounded semiannually, when held to maturity. And *after* maturity they go on earning 10 years *more*. Join the Plan today. Or invest in Savings Bonds regularly where you bank.

Safe as America – U.S. Savings Bonds

PUBLIC SERVICE ADVERTISING COUNCIL

The U. S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

Smooth Operation



Simplex
T.M. REG U.S. PAT. OFF.

PROJECTION and SOUND SYSTEMS

Sure . . . you're a projectionist, not a surgeon. And when you talk about smooth operation . . . you're talking about performance of equipment, not a neatly stitched appendectomy. You're talking about a sharp, steady picture on the screen . . . perfect sound . . . no noise . . . fast, trouble-free changeovers . . . ease of threading . . . and everything else that's part of your job in the projection booth. In short, you're talking about quality, dependability and durability . . . three of the major reasons why Simplex equipment is in use in almost every top theatre in the world!

MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION • DISTRIBUTED BY NATIONAL THEATRE SUPPLY
SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

GPE

PROJECTIONIST

INTERNATIONAL



AUGUST 1956

VOLUME 31 • NUMBER 8

30c A COPY • $2.50 A YEAR

No lamp in the World!

CAN PRODUCE SO MUCH LIGHT.

Peerless HY-CANDESCENT TRADE MARK REG

CINEARC

NOT A REFLECTOR ARC!

WRITE FOR DATA

Peerless MAGNARC TRADE MARK REG

CINEARC

A 75-77 AMP. REFLECTOR ARC!

22,000 TOTAL LUMENS ON SCREEN

NO-HIGH-RATE

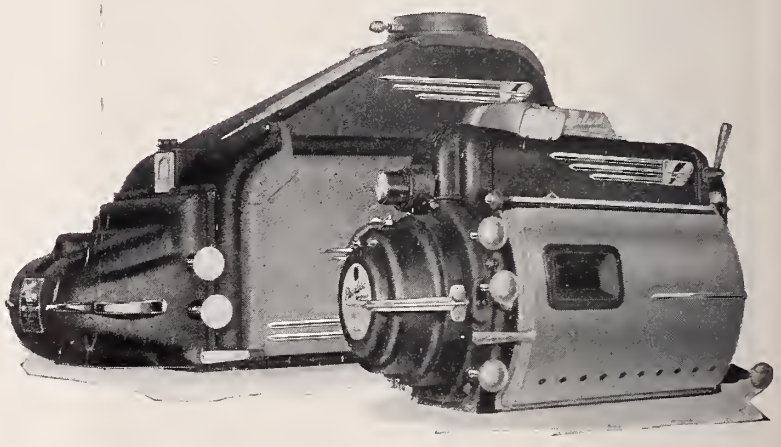
——— PROOF ———

Hy-Candescents were selected for all **important** "CINERAMA" installations. (Chicago, New York, Los Angeles, San Francisco, Philadelphia, and Washington, D. C.)

Hy-Candescents were chosen by Paramount for **all** installations of Horizontal "VISTA-VISION".

Hy-Candescents were again selected by TODD-AO for "OKLAHOMA".

You have to do the same if you want all the light there is for big pictures.



At 75-77 amperes . . . With presently available and standard 8 x 9 m/m copper coated carbons . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . With a 14" diameter No. 2012 PEERLESS "Hy-Lumen" glass reflector that retails at a list price of $22.00 F.O.B. Chicago . . . With a No. 2880 PEERLESS Tail Flame Flue . . . On any kind or any size screen . . . No Heat Filter required.

All of this, at the **lowest** possible first, and operational **cost**. And ———

OF ($60.00) REFLECTOR BREAKAGE AND SILVERING DETERIORATION OR HEAT FILTER UPKEEP !

J.E. McAULEY MFG. CO.

552-554 WEST ADAMS STREET

CHICAGO 6, ILLINOIS

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

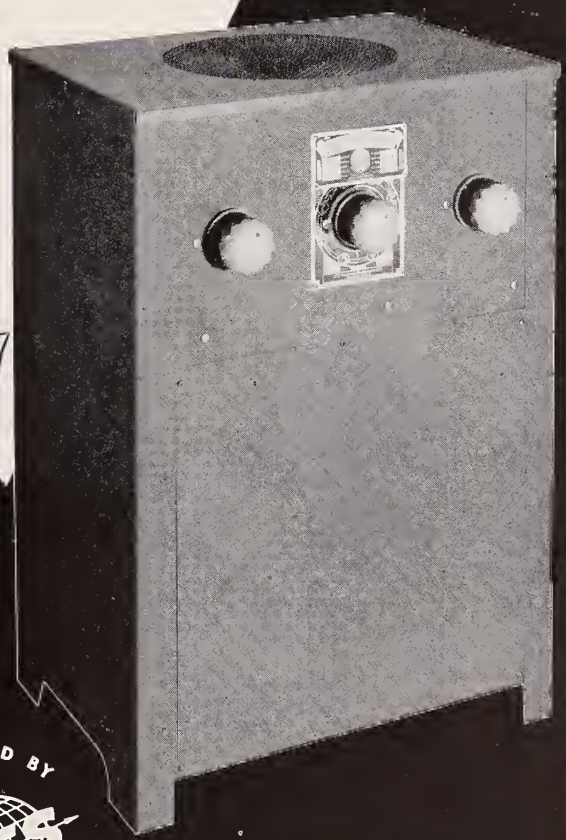
FOR COMPLETE DEPENDABILITY, HIGHEST EFFICIENCY, GREATEST ECONOMY

in converting A.C. current to D.C. for use in angle or coaxial trim high intensity projection arc lamps

Nothing takes the place of

EXCELENIUM RECTIFIERS

The Lowest Priced High Quality Rectifier Ever Made!



Full sized, damp-proofed selenium stacks. Dependable operation in damp climates. Convenient amperage output control white lamp is operating. Adjustment to compensate for line phase unbalance.

Glass-type transformer insulation withstands much higher operating temperatures, permits emergency operation of two lamps on one rectifier.

Ventilated by heavy duty fan.

Line control relay.

Four models: 90 to 135 ampere and 120 to 180 ampere three-phase, and 70 to 90 ampere and 90 to 135 ampere single phase.

3 year guarantee.

DISTRIBUTED BY

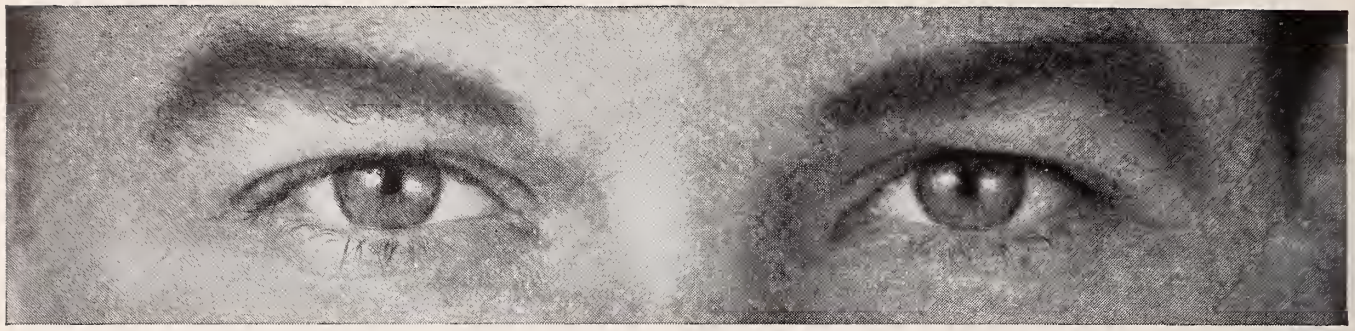
NTS

NATIONAL THEATRE SUPPLY

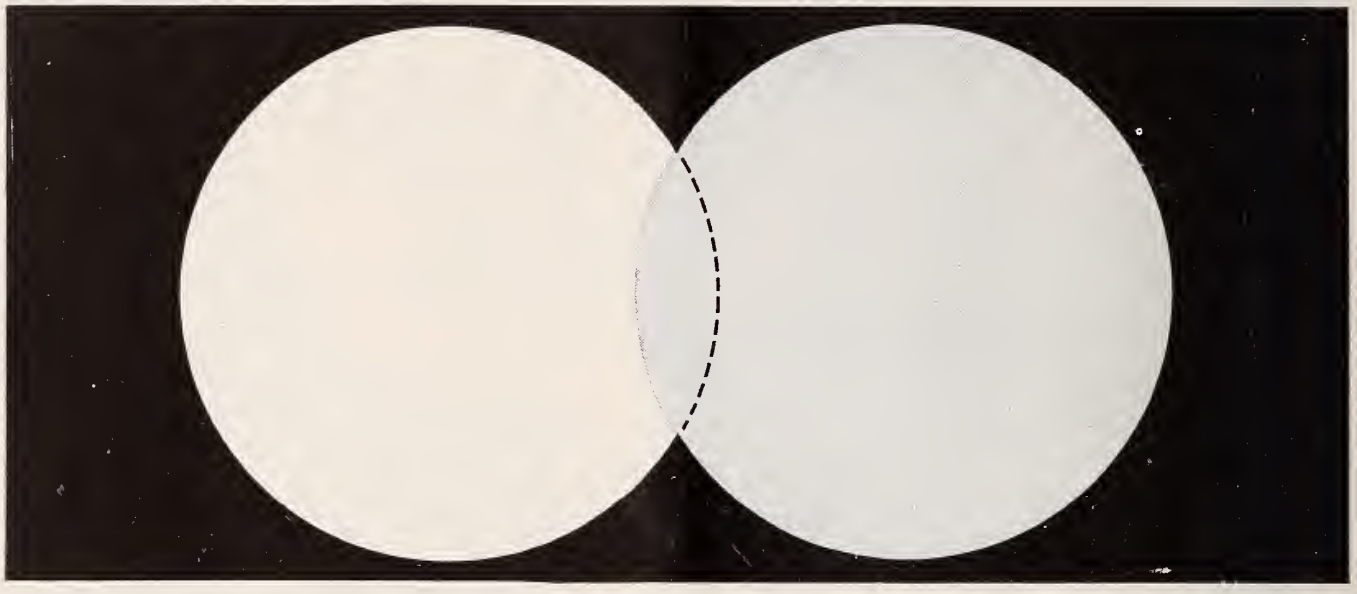
Division of National • Simplex • Bludworth Inc.

A SUBSIDIARY OF

ICPE



You can see the difference...



WITH THE NEW NATIONAL TRADE-MARK 11 mm H. I. PROJECTOR CARBON

• 10% More Light • Up to 25% Slower Burning

■ There *is* a noticeable difference in 10% more light. One of the circles above is as white as the paper it's printed on and is exactly 10% brighter than the other circle. You can *see* the difference, just as your customers can see the difference on your screen when you change to the new "National" 11mm x 20" High Intensity Carbon.

The past few months have seen constant improvement in the line of "National" Carbons. New "Suprex" 7mm and 8mm Carbons, a new 10mm High Intensity Carbon and now a tremendously improved 11mm High Intensity Carbon to bring you still more light on the screen at minimum cost.

Prove to yourself that the oldest and most extensive arc-carbon research and development program does pay off for you — in quality *and* in savings.



THE PICTURE IS LIGHT... GIVE IT ALL YOU CAN WITH "NATIONAL" CARBONS

The terms "National" and "Suprex" are trade-marks of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY • **A Division of Union Carbide and Carbon Corporation** • ***30 East 42nd Street, New York 17, N.Y.***

SALES OFFICES: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco • **IN CANADA**: Union Carbide Canada Limited, Toronto

International PROJECTIONIST

R. A. ENTRACHT, *Publisher*
JAMES MORRIS, *Editor*
R. A. MITCHELL, *Contributing Editor*

Volume 31 **AUGUST 1956** **Number 8**

Index and Monthly Chat 5

Magnetic Tracks on Release Prints 7
ROBERT A. MITCHELL

More About Pictures on Tape 10
ROSS SNYDER

A Pre-Selector Device for Sound Changeover 12
JOSEPH HOLT

Technician's Viewpoint 13

Big Hardtop Chains Shy of Drive-Ins 13

Muted Colors in "Moby Dick" 15
NORMAN WASSERMAN

In the Spotlight 18

Columbia Asks Projectionists for Help 20

Letters to the Editor 21

Brushup on Fundamentals, IV 22

Personal Notes 23

Faulty Projection Charge Refuted by Industry.... 24

New Products for the Industry 26

Book Reviews 27

Obituaries 28

Miscellaneous Items, News Notes, Technical Hints

INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co., Inc, 19 West 44 Street, New York 36, R. A. Entrocht, President. Telephone: MUrray Hill 2-2948. Subscription Representotives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Ploce, Wellington; ENGLAND and ELSEWHERE—Wm. Dowson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rotes: United States and U. S. Possessions, $2.50 per yeor (12 issues) ond $4 00 for two years (24 issues). Canoda ond Foreign countries: $3.00 per yeor and $5.00 for two yeors. Changes of address should be submitted four weeks in odvonce of publication date to insure receipt of current issue. Entered os second-closs motter Februory 8, 1932, ot the Post Office at New York, N. Y., under the oct of March 3, 1879. INTERNATIONAL PROJECTIONIST ossumes no responsibility for personal opinions appearing in signed orticles, or for unsolicited orticles.

Entire contents copyrighted 1956 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

420

Monthly Chat

Source of Projection Troubles

COLUMBIA Pictures Corp. deserves much credit for the understanding and helpful remarks contained in a pamphlet it is currently distributing to projectionists handling its pictures. The studio goes on record in admitting the difficult technical problems involved in projecting a high-quality image on large screens. Then some suggestions are made for solving these problems. There is nothing particularly new about what is said, and the pamphlet contains nothing that has not been previously carried in the pages of IP. However, it is most reassuring to have production people take a sincere interest in the problems of the man in the projection room who in the long run has the final responsibility for presenting the show.

This constructive attitude on the part of Columbia is much in contrast to the completely unreasonable and unfair opinion reportedly held by many producers concerning both projectionists and exhibitors. Tom Pryor, Hollywood correspondent of the New York Times wrote recently that producers are apt to denounce "sloppy" theatre operation and faulty projection at the drop of a hat. The facts are that many hard-working projectionists find it almost impossible to do a good job because neither their theatres nor much of their equipment were designed for big screen projection. Columbia investigated this situation and tried to help by making suggestions that are at least partial solutions to projection problems.

The Circus Is in Trouble

THE MEN who decide the policies of the motion picture exhibition industry might do well to ponder the early closing in Pittsburgh of Ringling Bros. and Barnum & Bailey Circus. It was also announced that the Ringling Bros. circus performed under canvas for the last time in Pittsburgh. In the future, the show will play only at large arenas in certain cities.

Just why was the circus forced to close before completing its tour? Maybe the reason is that much of the public, including kids as well as grownups, had come to regard the "Greatest Show on Earth" as old-fashioned. These are people who can travel hundreds of miles by automobile to varied vacation resorts, who can fly from one end of the country to the other in less than half a day, and who have access to a diverse store of entertainment and information over TV as well as in the movies. The isolated small-town audiences that once flocked under the big top no longer exist.

The circus was not squeezed out by direct competition from the home TV set, although TV may have been one of the influences that changed the public attitude. The fault, more likely, was that the circus was outmoded.

Could it be that people have been staying away from motion picture theatres because they grew tired of watching monotonous pictures presented with broken-down, inefficient projection equipment? If so, future prosperity of the exhibition industry can only lie in presenting first-class entertainment. Not only must the story be interesting, but both screen image and sound must be as pleasing and impressive as possible.



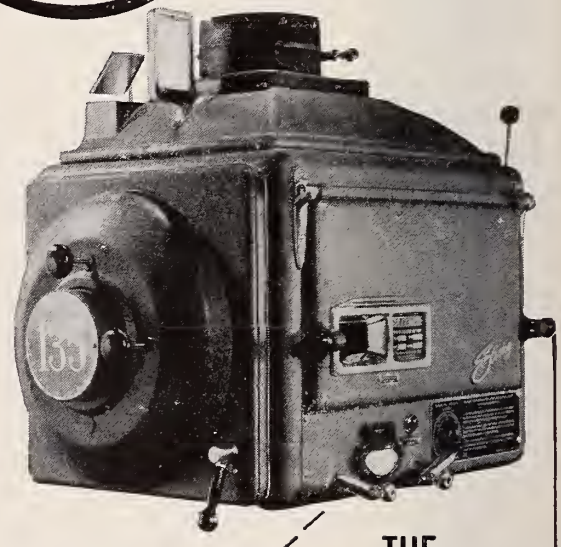
Remember how radio "killed" the picture business • • •

. . . how night baseball cut theatre attendance—
how TV dropped the curtain on the movies NINE YEARS AGO?

For 40 years now, some theatremen (not showmen) have contended that it is foolish to invest in new equipment. Meanwhile, radio and television men have regularly accepted all new improvements . . . even welcomed them. It has paid off handsomely for them. Investment in new type theatre equipment has similarly paid big dividends to alert theatre owners, especially those who are quick to install the latest. They say, "phooey to the boogeymen."

Among other things, you should now install the latest type projection arcs. Without them, you can't properly present the wondrous new film processes . . . you can only wait for the sheriff.

Even a shortage of cash needn't cause you to hold off buying another day. Ask your Strong dealer about his time payment plan. For full information use the coupon.



THE STRONG ELECTRIC CORPORATION

31 CITY PARK AVENUE • TOLEDO 1, OHIO

Please send for free literature on Strong Projection Arc Lamps.

NAME _____

THEATRE _____

STREET _____

CITY & STATE _____

INTERNATIONAL PROJECTIONIST

VOLUME 31 AUGUST 1956 NUMBER 8

Magnetic Tracks on Release Prints

By ROBERT A. MITCHELL

The use of magnetic sound by the CinemaScope sound-on-film reproduction method, and also with separate reproducers for "roadshow" presentations, is now an important phase of projection technique. This is the first of two articles on operating magnetic equipment.

THE POSITION attained by magnetic sound recording and reproduction since the end of World War II is nothing short of phenomenal. Home recorders, office dictating machines, telephone-conversation transcribers, and automatic radio monitors are among the many useful devices which have been made commercially feasible by the marvelous magnetic properties of plastic tape coated with lacquer containing a highly refined variety of ordinary iron rust.

Even the smallest radio broadcasting station can now afford to record network programs for later replaying and to pick up on-the-spot news events by using magnetic tape in inexpensive recording apparatus. And when the need for the record is past, the tape may be completely erased by running it through a high-frequency magnetic field and used for new recordings!

Ease of Use

Everyone loves music, as the prosperity of the phonograph industry testifies. Now, disk records have been improved in quality, and their musical possibilities expanded, by magnetic-tape "originals." Magnetic tape can be used for multiple recordings; it can be cut and spliced with ease, permitting a freedom of sound editing which is laborious and expensive in other recording media.

Startling new uses for magnetic tape are being developed all the time. Not only sound, but TV images can be recorded on tape; and not only monochrome, but pictures in full color! And in the field of music, continuous belts of magnetic tape are used for novel echo effects, and "synthetic" electrically generated tones may be combined on tape and reproduced stereophonically to produce the effect of vast symphonic choruses that musicians could heretofore only dream about in wild flights of tonal imagination!

Motion-picture sound has been revolutionized by chocolate-brown magnetic soundtracks—so dull in appearance, yet so amazing in audio possibilities! The acoustic realism of Cinerama, Todd-AO, Thrillarama, and other special "showcase" processes is well known. But even CinemaScope stereophonic sound, reproduced directly from narrow magnetic tracks "striped" upon the picture film, is merely a minor manifestation of the extensive influence of magnetic recording upon the movie-making industry.

Just as the manufacturers of phonograph records now make magnetic-tape originals and record the master disks from these, most movie producers now use magnetic recording in place of the older method of "optical" recording on motion picture film. So convenient is the magnetic-track method (permitting immediate playbacks and eliminating the need for processing), and so nearly perfect in quality (low distortion and low ground-noise level with wide volume and frequency range), that it has become standard studio practice to "mix the sound" on magnetic tracks — adding music and sound effects to the original dialogue record—before transferring the combined record to the optical "master positive" from which the duplicate release-printing negatives are made.

Optical Recording

Before the advent of magnetic recording, sound for motion pictures was recorded photographically; and the process of combining a number of optical tracks by the sound recordist

invariably resulted in an undesirable increase in distortion and ground noise. The sound-distorting factors were largely photographic in the case of variable-density tracks and optical in the case of variable-area, or "sawtooth," tracks.

Uneven brightness along the length of the scanning beam has always been troublesome in the reproduction of the latter type of track, a difficulty minimized by placing from 2 to 6 very narrow sawtooth tracks side by side in the 0.084-inch soundtrack band.

Magnetic tracks are also subject to distortion and ground noise: but when such tracks are of adequate width (¼ inch or wider on 16-mm. 17½-mm. or 35-mm magnetic-coated film) and very carefully handled in recording and replay equipment maintained in the best possible condition, the quality of reproduction is higher than in any other recording medium. Much of the high quality of modern theatre-print optical soundtracks may be attributed to the magnetic-track originals from which they were made.

The handling and upkeep of magnetic recording and reproducing apparatus, it must be emphasized, is by no means a simple matter. Moreover, the magnetic sound records must themselves be treated very tenderly and protected from influences which could easily harm them. When magnetic sound reproduction is employed in theatre projection, for example, *it is best to use separate sound films which have nothing on them but the magnetic soundtracks.* This is done in Cinerama, Todd-AO, and other special projection processes.

CinemaScope Sound

The CinemaScope method of placing four very narrow magnetic tracks on the same film that carries the pictures unfortunately obviates many of the advantages of magnetic sound. Only the convenience of the multiple tracks for stereophonic reproduction remains; but that is a questionable advantage from the commercial point of view, as we shall later see.

CinemaScope magnetic sound is much simpler in theory than in actual practice. The magnetic tracks are transferred to the celluloid side of specially perforated CinemaScope print film from plastic rollers or cellophane bands. Two of the magnetic tracks are placed on the margins outside the sprocket-hole areas, while the third occupies the position of the optical track on regular film. Each of these three main tracks (left, right, and center reproduction channels) is only 0.063 inch in width, accommodating a scanning-gap length of 0.050 inch.

A fourth track for auditorium-speaker sound effects is placed inside the opposite row of perforations, and is only 0.029 inch wide. Most theatres having stereophonic-sound installations make no use of this track. Aside from the fact that the average audience does not care for so much noise when it attends motion pictures for relaxation, the 12.000-cycle control signal recorded in the fourth track is not always reproduced with sufficient signal strength for dependable operation of the fourth-channel amplifier.

The newly striped magnetic tracks are prepared for the reception of sound records by pre-magnetization with high-frequency magnetic fields. The tracks thus "biased" are then passed over a recording head consisting of a "cluster" of four sound magnets, one for each track. Each magnet is energized by amplified sound current from a master sound film; and the resulting fluctuating magnetic fields produce varying degrees of magnetization of the iron-oxide particles in the sound tracks. The finished tracks then contain a series of magnetic fields corresponding to the variations of the original sounds.

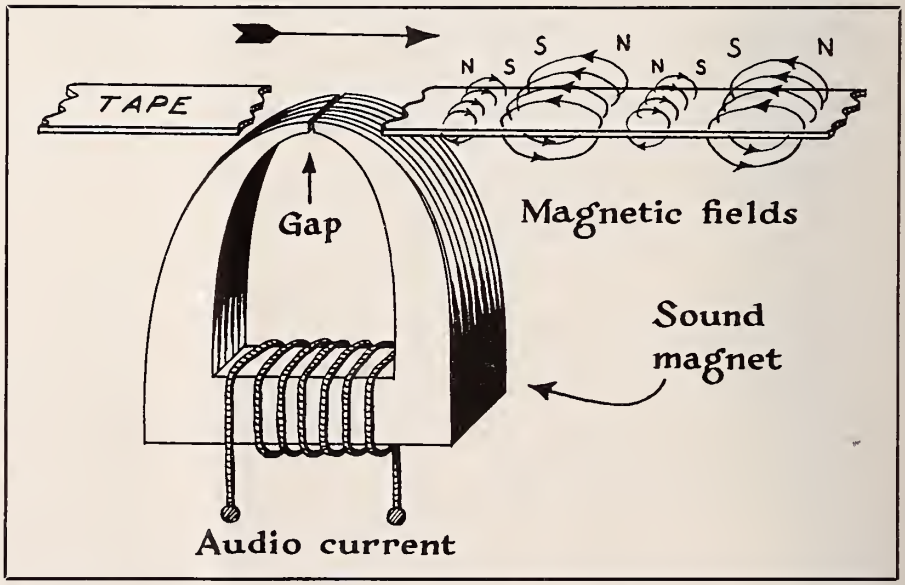
The magnetic fields of the magnetic soundtracks are extremely weak. You cannot pick up tacks with them, or even hear the sound without a tremendous amount of amplification. In fact, greater amplification is needed for CinemaScope magnetic sound than for regular optical sound.

Magnetic Fields

It is noteworthy that the magnetic tracks must run in *actual contact* with the sound-magnet pole pieces in both recording and reproduction. The gap separating the poles of each magnet is so short (about 20 microns = 0.0007874 inch) that any separation of the film from the pole pieces would result in shunting of the magnetic circuit with severe distortion and loss of sound volume. This is why a worn magnetic pickup unit in a CinemaScope "penthouse" reproducer has such a bad effect upon the sound.

A wider magnetic gap would minimize these defects and produce stronger sound signals; but any widening of the gap automatically decreases high-frequency response. With the 0.7874-mil gap (compare with the width of the optical-sound scanning beam, 1¼ mils to 0.75 mil, depending on make of soundhead), sound frequencies somewhat higher than 12,000 cycles can be recorded and reproduced at the standard film speed of 18 inches per second.

The common notion that Cinema-



By passing a tape coated with magnetic iron oxides over the gap between the pole pieces of an electromagnet energized by sound currents, a magnetic sound record is produced in the tape. The record consists of innumerable tiny magnetic fields. Subsequent passage of the tape over a similar "sound magnet" induces currents corresponding to the original sound. The currents induced in the electromagnet coil are so weak, however, that they must be amplified millions of times to operate loudspeakers.

Scope magnetic sound can handle higher frequencies than regular optical sound is open to question. True, the "top cut" of optical reproduction has been deliberately lowered by the 1¼-mil scanning beam in the interest of noise reduction; but the demonstrable fact that optical sound more easily provides a level response over the entire frequency range is indication of an advantage over CinemaScope magnetic sound.

Design of Pickup

It should be remembered that the strength of the tiny magnetic fields set up in the magnetic track decreases rather sharply above 4.000 cycles, necessitating an abnormal treble-boost in the frequency-response characteristics of both the recording and playback amplifiers. This treble boost compensates for the attentuation or weakness of the higher frequencies in CinemaScope magnetic tracks, but it has the bad effect of increasing the ground-noise level and reducing the dynamic range of the magnetic sound process.

Magnetic recording (and, of course, reproduction as well) would be seriously hampered should magnetic powder rub off from the tracks and collect in the narrow gap which separates the pole pieces of each sound magnet. To prevent magnetic shunting by iron-oxide dust from the tracks, a piece of mica or similar non-magnetic material having the same thickness as the gap distance is sandwiched between the poles. The magnetic track thus rubs across the iron pole pieces and the non-magnetic gap filler, wearing both down at the same rate. Difficulties appear whenever the pole pieces and the gap separator have slightly different hardnesses, one wearing down more rapidly than the other. Too soft a separator allows magnetic powder to collect between the poles, weakening the signal; too hard a separator introduces a type of even-harmonic distortion known as "crumbly cough" from its harsh sound.

Deterioration of the narrow CinemaScope tracks and unavoidable wear of the magnetic pickup heads often result in inferior sound reproduction. Uneven wear of the pickup may disturb the stereophonic effect, actually shifting the apparent direction of the sound as it comes from the screen. The greatest care must be exercised, therefore, to keep the penthouse reproducer clean and properly adjusted, and to protect CinemaScope soundtracks from harm by demagnetizing projector parts and keeping the prints as far away as possible from motors, arc lamps, rectifiers, transformers, and rheostats.

The magnets of simplified high-intensity arc lamps are particularly harmful because their magnetic fields are strong. Even an electric buzzer presents a serious hazard to magnetic soundtracks!

Noise is indelibly recorded in magnetic tracks when CinemaScope films are rapidly moved through fluctuating magnetic fields. A stationary relationship between the extraneous field and the print usually results in weakening or erasure of the sound without the pickup of audible interference.

Damage Invisible

Magnetic tracks have the disadvantage to projectionists and exchange inspectresses that neither the sound record nor any magnetic damage present is visible to the eye. (Studios possess apparatus which translates magnetic tracks into visible images.) The sound may have been accidentally erased by exposure to an alternating magnetic field, or contaminated by extraneous noise: *The damage does not make itself evident until the track is played.* But whereas small scratches may seriously interfere with optical tracks by introducing hissing and clicking noises, even severe scratches do not affect magnetic tracks noticeably.

As a rule, however, only old, worn-out prints are afflicted by emulsion scratches deep enough to spoil optical-track reproduction. (Bad scratches in the soundtrack area of relatively new prints is accidental and rather unusual.) But magnetic prints are usually quite unusable at a similar stage of normal physical wear. *Repeated* exposure to weak magnetic fields produces accumulative effects—and weak magnetic fields seem to pervade most theatre projection rooms, containing, as they do, a variety of electrical apparatus.

Careful Handling Needed

Steel shipping reels acquire magnetism from many sources. A sharp blow, for example, may produce in the flanges a magnetic field several hundred times more powerful than that present at any point in the magnetic soundtracks of a CinemaScope print. The earth is a big magnet;* and a sharp rap enables the iron atoms in a steel object to align themselves with the earth's natural magnetic field. Rewinding the film from one such magnetized reel to another may have the effect of weakening the magnetic sound record and producing volume variations in one or more of the four tracks. The higher frequencies of sound are especially liable to attenuation, with the consequence that music loses its brilliance and speech becomes muffled.

Magnetic-track film should be warmed to room temperature on cold, dry days before it is rewound. Static electrical charges acquired by film in dry air produce snapping noises even in optical-track prints, but only magnetic-track prints are permanently damaged by them. Static discharges may result in permanent magnetic disturbances which are reproduced each time the film is shown.

In addition to keeping magnetic-track prints as far away from electrical apparatus as possible to avoid track deterioration and noise pickup, special precautions must also be taken when such prints are rewound and inspected. For example, magnetic-track prints

(*Continued on page* 30)

Carbon Tet Can Kill

Projectionists who are in the habit of carelessly handling carbon tetrachloride should take special note of the recent death of Hollywood film editor Paul Lord. He collapsed at work and was taken to General Hospital where he later died. The coroner's report ascribed the death to uremia, with carbon tetrachloride poisoning as a contributing factor.

The treacherously poisonous nature of carbon tetrachloride must be guarded against when cleaning film. Carbon tet can kill! Headache and nausea are a first warning of carbon tetrachloride poisoning. Prolonged breathing of the fumes, or continued absorption of the liquid through the skin may result in fatal illness. When it is necessary to clean film with this fluid, the job should be done in a well-ventilated room near an open window.

* Like any other magnet, the great terrestrial magnet has a north pole and a south pole. Its north pole is presently located in Ommanney Bay in the dreary Prince of Wales Land, Northwest Territories, while the south pole is located on the lifeless Adelie Coast of the desolate Antarctic Continent.

More About Pictures on Tape†

By ROSS SNYDER
Ampex Corporation

Many difficult problems faced Amplex engineers in designing a television tape recorder using reels of manageable size.

LOOKING at the advantages which magnetic tape recording had brought to the radio broadcast industry, many engineers visualized its application to TV, when a means might be found of recording the 4 mc (megacycle) video signal.

Several approaches were open to them, and each had its adherents. Basically, the problem involved packing enough information onto a reel of magnetic tape of manageable size to reproduce all the video information in a program of a half-hour or an hour in length. The rate information transmission is proportional to the complex product of the bandwidth and the signal-to-noise ratio. In TV, a satisfactory signal must be at least 4 mc-wide and over 30 decibels "deep."

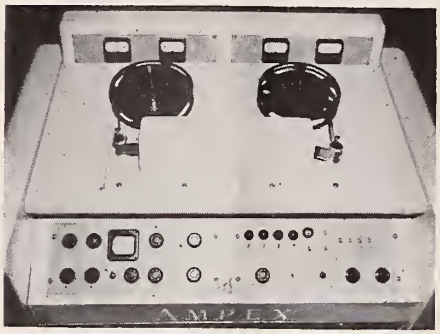
The maximum recordable frequency with a magnetic tape recorder is set by the effective gap width and tape velocity. The magnetic head "sees" substantially only that part of the tape which, at any given instant, is in the head gap. So long as only a small part of a single cycle is in the gap at any moment, the head will "see" a changing flux, and its output will be proportional to the rate of that change.

But when one whole cycle appears in the gap, the average value of the positive and negative half cycles equals zero, and the output of the head is zero. Thus, the narrower the gap, the shorter the wavelength which that head can reproduce effectively, or, the higher the frequency it can reproduce at a given tape speed.

Tape-Speed Problem

In audio receivers a magnetic head of 0.005 inch gap width can reproduce a wavelength as short as 0.001 inch along the tape, or 7,500 cycles per second at 7½ inches per second. A quarter-mil head, on the other hand, will effectively reproduce a half-mil wavelength, or a 15,000-cycle signal at 7½ ips.

If we used a quarter-mil head gap, then, we might expect that we would require a tape speed of 2,000 ips to reach an upper frequency limit of 4 mc. At that rate, a reel of magnetic tape 14 inches in diameter and 4,800 feet long would record a little less than 29 seconds of program material.



Top view of Ampex video tape recorder. It can record a full-hour TV show on a 14-inch reel of magnetic tape 2 inches wide.

The precision required to manufacture a magnetic head so that the entire length and depth of the two gap faces are separated by exactly 0.000125 inch is very great. Even so, with utmost care, under conditions of precisely controlled light, temperature, and machinery, heads with this effective gap can be made. Any improvement made in this direction, however, leads not only to exceedingly knotty production problems, but also in the direction of great delicacy of equipment, where ruggedness is greatly to be desired.

Furthermore, substantial reductions in the gap width must be accompanied either by decreased signal, with consequently decreased signal-to-noise ratio, or by decreased head life. This is because signal output is approximately proportional to gap width, and inversely proportional to gap depth. Therefore, if gap width is decreased, the signal must either decline, or the gap depth must be decreased, leaving less and less head material to be worn away in use.

Transverse Recording

This impasse led to experiments with the possibility of "chopping up" the video signal into 2, 4, 6, or more blocks, of proportionately narrower bandwidth, and then recording these on wider tape, using multi-channel heads. There are a number of ways in which this approach might be implemented, either with filters or with a synchronized sampling system. Only an exceedingly complex breakdown system gave any hope of reducing the tape speed to a conventional speed for magnetic recorders.

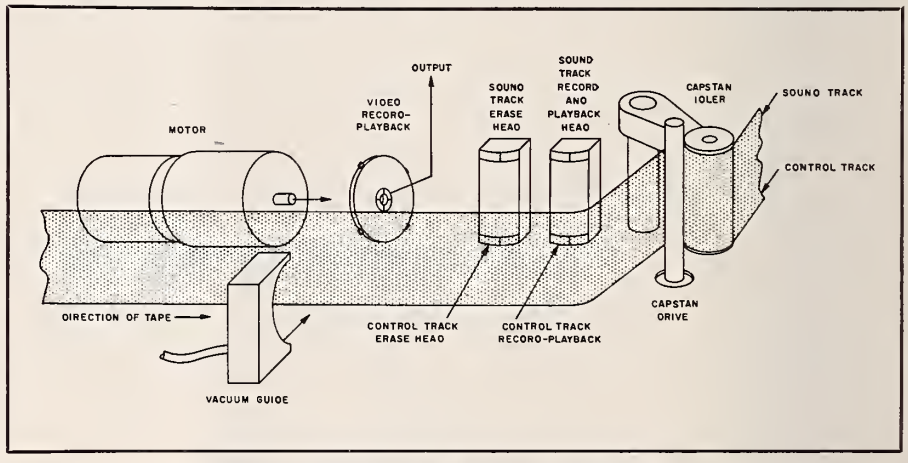
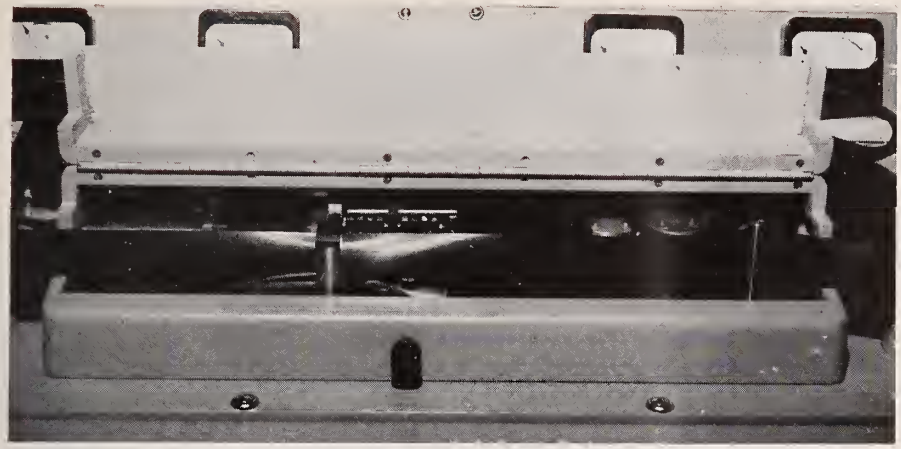


Diagram of multi-function magnetic recording head.

A third approach attains high relative speed between heads and tape by rotating the heads at high speed *across* the tape, and moving the tape itself only fast enough to avoid interference between successive tracks. The longitudinal tape speed required now depends upon the required width of the individual tracks, the rotational speed of the head drum, the minimum spacing between adjacent tracks as determined by the effects of crosstalk, the stability of longitudinal tape speed control, and the effects on the output sig-

† This article appeared originally in the Aug., 1956, issue of Tele-Tech & Electronic Industries under the title "Ampex's New Video Tape Recorder."



A vacuum holds the tape to the curving contour of the recording head.

nal of errors in tracking. It proved possible, by this means to adopt a tape speed of only 15 ips, thus obtaining more than an hour of recorded program on a 14-inch reel of two-inch Mylar polyester based tape.

The equipment developed exceeds the FCC maximum rate of change of information standard of 0.15% per second. It is capable of holding the maximum horizontal line error to 0.1 msec (miliseconds), with only occasional minor adjustment during operation. The 15 ips tape speed is made possible by a special FM carrier system, a precision transport control system, and a unique head construction.

Head Assembly

Four heads are mounted on a drum which rotates at approximately 14,000 rpm and is precisely synchronized with the tape drive capstan. The net resultant speed for the application of video signals is approximately 1500 ips.

The two-inch-wide tape is held in conformity to the circular shape of the head drum by means of a vacuum system. During operation, one head is always in contact with the tape. Each head, in its turn, is connected to the electronic elements of the system by commutation, its timing under strict control. During the playback process, the relation between the rotational velocity of the head drum and that of the capstan drive is maintained to within very narrow limits through the use of a control track along the lower edge of the tape. A reference signal is recorded on the control track and, during the playback, is amplified and used to control relative speed of the drum and capstan.

After the incoming video signal has been amplified and used to modulate the signal to the heads, it is passed through the necessary electronics to provide a video monitor circuit. The picture appearing on the monitor is thus derived from the same FM signals which feed the heads. Actual current in the record heads is indicated by a meter on the control panel. Positive assurance that normal recording is in process is thus always visible.

The sound track is recorded directly along the upper edge of the two-inch tape in a conventional manner. The circuitry and performance of the sound system are comparable in every way to those of a professional audio recorder. Frequency response and signal-to-noise ratio make the fullest possible use of the FM television sound transmission medium. Preservation of high fidelity sound, long unavailable in delayed television broadcasts, is an inherent advantage of this magnetic recording method.

The "live" quality of the video tape playback is due mainly to two inherent advantages over fast photographic delay systems. The electrical transfer-characteristic of the special FM recording process is inherently very nearly linear, giving faithful reproduction of the full gray scale. The resolution capability of the video tape recorder considerably exceeds that of the average TV receiver.

Thus, when a tape recorded program is telecast, the limitation of picture quality will be in the home receiver rather than in the transmission. Horizontal resolution, determined by the bandpass and by the constants of American TV broadcast standards, is 320 lines.

Serves Varied Purposes

In function, the video tape recorder is a logical extension of present day audio recording practices. In common with audio tape recorders, it has push-button control, re-usability of tape, immediate playback, and excellent relation of original versus reproduced quality. It can, therefore, perform for the TV industry something like the same revolution which the audio magnetic recorder has already performed for the radio and recording industries.

Since the video tape recorder is basically a long-playing, wide-band recording device which presents at its output all of the information in a signal 4 mc wide with a signal-to-noise ratio in excess of 30 db, it is clear that the unit is adaptable for color TV, radar signals, computer information, and other high-speed data. Engineers are already approaching the solution to the problem of color TV recording, with the eventual aim of producing a machine handling either monochrome or color.

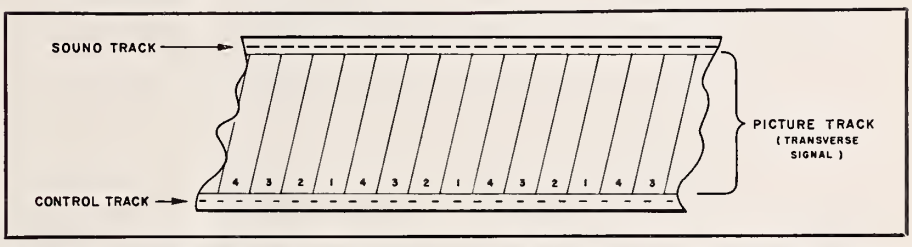
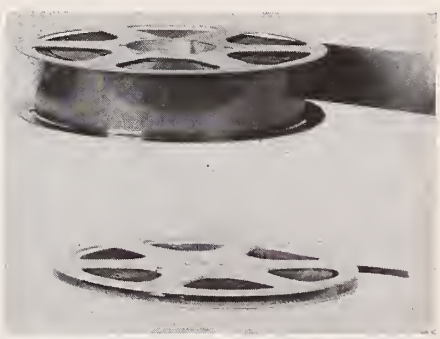


Diagram of the transverse path taken by the recording head across the 2-inch-wide tape. This side-to-side path of travel makes possible an actual pickup speed of 1500 inches per second while the tape is unwinding at a speed of only 15 inches per second.



The 2-inch-wide tape compared to conventional ¼-inch tape used for recording magnetic sound.

Described here is a means for preventing possible errors during changeover in magnetic equipment.

A Pre-Selector Device For Sound Changeover

By JOSEPH HOLT

BECAUSE of the widespread use of both magnetic and optical sound tracks in release prints, there is a need for a method of pre-selection of sound changeover in order to lessen the chance of improper transfer of sound. Considerable personal attention has been given to this problem, and I find that the device I am about to describe has proven completely satisfactory in practical use.

Systems using relay transfer methods adapt themselves readily to the circuit detailed in Fig. 1. With slight changes dictated by polarity considerations, this circuit will work with at least three popular types of theatre sound systems.

Examination of Fig. 1 will show that the transfer of relay contacts used for momentary energizing of magnetic or optical relays is done by a ganged rotary switch which also accomplishes the polarity reversing sometimes required for proper operation of relays.

It will also be noted that the rotary switch has three positions, one of which operates a tally light to indicate that magnetic transfer will be accomplished upon the next operation of the picture dowser button. The middle position disconnects the contacts from the transfer circuits and leaves the sound changeover fully manual. The third position will result in transfer to optical from magnetic and the corresponding tally light will so indicate.

Following is a description of how this system operates along with data on the parts used:

Parts Easily Obtained

Each projector is provided with a relay coupled to its douser opening coil in such a manner as to allow each pair of contacts to remain open until such time as the dowser switch is depressed for picture changeover. Each relay is selected with the proper coil for the picture dowser supply, usually 115-volt A.C. Most wholesale radio supply houses can provide excellent relays with contacts rated at about 4 amperes. These are well suited to the purpose and cost about $4 each.

Tally lights should be selected to match the voltage of existing tallies or the voltage used for the sound transfer relays. Relays, selector switch, tally lights, and interconnecting wiring are housed in a small metal box 3″ x 4″ x 5″, or such size as will augment the present sound transfer box. The system can be wired in less than an hour.

Operation of the pre-selector can be understood by noting that the device takes power from the power supply of the magnetic system, and will function only when that low-voltage power supply is operating, although the relays tied to the picture dowser circuit will close each time the dowser button is depressed.

This arrangement is designed to make accurate fusing of the entire dowser easy and practical. It might be well to mention here that the writer has visited many projection rooms in various sections of the country where the dowser circuit was fused many times over the actual current required for the dowser coils.

After the relays added with the pre-selector device are installed, it is recommended that a fusetron of about 3 amperes rating be placed in the dowser fuse plug. The dowser button should then be held down for a timed five-second interval. In most cases the 3-ampere fusetron will hold for 10 seconds or slightly longer.

Fusing the System

The installation of fusetrons will mean that the dowser circuit may be fused somewhat below its actual current rating with perfect safety. Operation will be continuous, and the special protection afforded by the fusetron will prevent the coil from burning out in cases of momentary sticking.

When a magnetic reel is threaded, the pre-selector switch is rotated to the "magnetic" position and remains there as long as magnetic reels are being run. Magnetic outputs are switched automatically to the projector whose opening dowser coil is energized. When optical output is desired, the selector is set on the proper position, and the optical transfer relay will be tripped by either projector relay. Expansion to 3-projector operation merely requires the addition of one relay for each projector and the addition of another ganged section for each projector to the rotary switch.

This device has been in trouble-free operation under practical projection room conditions for several months. The only defect thus far uncovered is the fact that both tally lights burn in series when the selector switch is in the center or manual position.

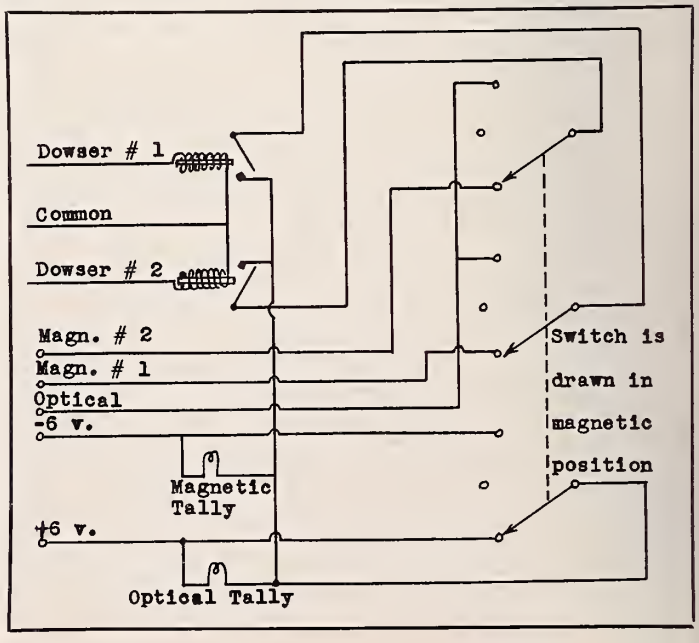


FIGURE 1. Schematic of changeover pre-selector.

Technician's Viewpoint . . .

A monthly department that explores new ideas and current problems affecting projectionists.

WE TALKED recently to a projectionist with an arc lamp problem. He always adjusts the positive carbons in his Suprex-type lamps so that the crater image just touches the vertical line in the arcoscope card. Other projectionists in this theatre, however, place the crater image either directly on the line or just in front of it. These slight differences in arc focus show up on the screen as yellowish or bluish colorations of the light. He wants to know the correct position.

It would seem that his arcoscope cards had only two vertical lines, one for the image of the negative tip and the other for the image of the positive crater. Since arc focus is very critical in simplified high-intensity lamps, it is advisable to avoid confusion anent crater positioning. Here is one way to solve the problem:

Remove the arcoscope cards from the lamps. Using black India ink and a fine ruling pen, rule another vertical line beside the positive-crater line on each card. The new line should be not less than 1/16" and not more than 3/32" from the positive-crater line, and preferably on the side away from the negative-tip line.

Return the cards to their frames on the lamphouses. Light up one of the lamps. Project blank light to the screen and move the arc forward and back until a position is found where the light is brightest, whitest, and most uniform in distribution. Then adjust the arcoscope card so that the image of the positive crater falls between the *double* indicating line. Fasten the card in place and repeat the process with the other projector. See Fig. 1.

With *two closely spaced lines* to indicate the position of the positive crater, more accurate and reliable arc focusing will result. The intensity and quality of the screen illumination will then be more likely to remain constant for all the projectionists in a crew.

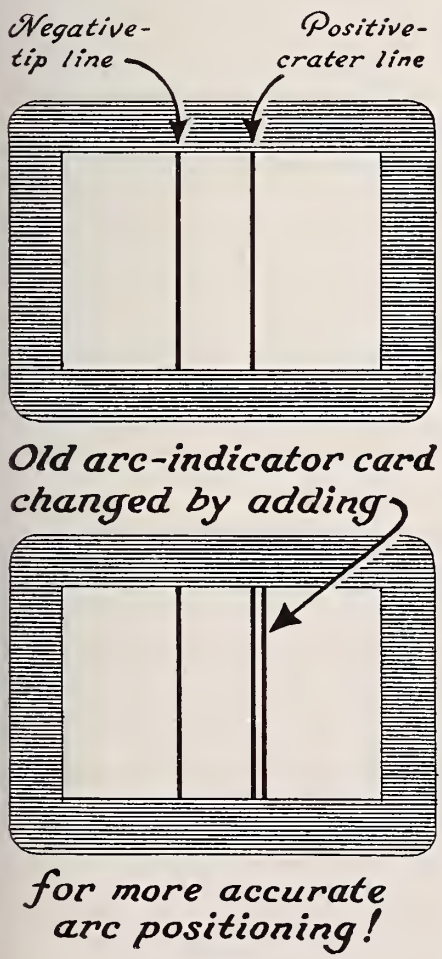


FIGURE 1

DO YOU know that it is possible for you to power your soundhead exciter lamps with AC if your DC exciter supply (a small rectifier) fails?

While direct current is preferable to alternating current for powering exciter lamps, many small theatres use AC for this purpose, the proper voltage being supplied by inexpensive transformers. If the frequency of the AC is 60 cycles per second, a faint 120-cycle hum will be heard in the speakers, but only when the sound system is operating with no film in the projectors. When film is run, the use of AC exciter current produces no noticeable effects.

The transformer method is excellent as an emergency measure in case of rectifier breakdown. A doorbell or toy electric-train transformer may be used if the secondary taps supply the voltage required by the exciter bulb. Two bell transformers with primaries connected in parallel and secondaries in series provide twice the voltage of one transformer. If the primaries are in series and the secondaries are in parallel, one-half the voltage of a single transformer is obtained.

In lieu of a suitable transformer, the exciters may be powered directly from a 120-volt light socket by interposing a resistance of sufficient voltage-dropping capacity in series with each exciter. A double-pole, double-throw switch may be used as a "fader" or sound changeover, as shown in Fig. 2.

Assuming that the AC line voltage is 120, the required value of the resistor in watts is given by:

$$W = \frac{14{,}400\ A}{120 - V}$$

in which A is the ampere rating of the exciter and V is its volt rating. Thus a 9 V, 4 A bulb would need a 519 W resistor, and a 10 V, 6 A bulb would need a 786 W resistor. To avoid the danger of exciter burnouts, the watt rating of the resistor should be a trifle lower than the calculated value.

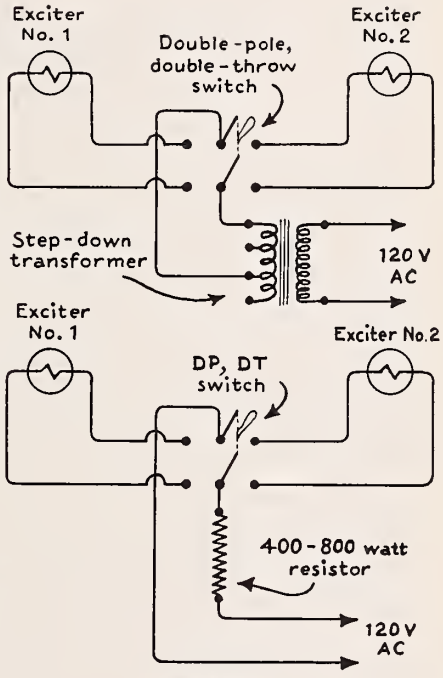


FIGURE 2

Electric flat-irons, heaters, and hot plates have very nearly the correct wattage ratings for use as voltage-drop resistors. The regular exciter source should be disconnected at the soundheads to avoid feeding AC into the defective DC power supply.

A PROJECTIONIST remarked to us not long ago that his sound system was bedevilled by squeals and whistling noises that seem to accompany loud signals. He wanted to know exactly what causes this high-pitched interference.

Whistles and squeals of the kind described are caused by "microphonic" tubes in the first voltage-gain, or photocell preamplifier, stage. This condition may also occur in magnetic-track amplifiers, and indicates over-volting and os-

cillation as well as bad tubes. Photocell ionizing voltage should never be higher than that recommended by the manufacturer of the cell.

Turn the sound system on and *very lightly* tap the voltage-gain tubes with a pencil. A loud ringing noise will be heard in the speakers when the defective tube is tapped, although even good tubes in the preamplifier may produce some degree of noise when struck. Replace the microphonic tube and check the line voltage supplied to the amplifiers, reducing it if too high.

ARTICLES have appeared lately in IP and elsewhere on the Eidophor system of theatre TV. This system is extremely interesting technically and may become quite important commercially. However, some of the comment we've heard would indicate people have got the impression that the system is completely perfected and just about ready for installation in theatres. Such is not the case. At present, this interesting Swiss system is not ready for commercial use, and it cannot compete costwise or in image quality with the more familiar picture-tube method of projecting TV *via* a large mirror and a Schmidt lens.

Although scientifically sound, the Eidophor apparatus is very costly and troublesome to adjust and operate. Even the arc lamp employed burns special expensive carbons and requires an unusually high degree of technical proficiency on the part of the operator.

It goes without saying that large-screen TV requires further improvements in equipment; but the success of this new medium depends now, as it always has, upon *timely*, audience-attracting program material. "Staged" productions are handled much more satisfactorily, and at lower cost, by standard film projection. TV may never attain the brilliance and image clarity of film.

A 35-mm projector is a precision machine which can perform its function properly only when all parts are in good condition and in their intended relation to one another. For example, take the case of a Super Simplex machine which became very noisy after an intermittent sprocket had been changed even though the picture remained perfectly rocksteady. What was wrong?

A close examination indicated that this movement had become noisy because the starwheel and cam had become displaced in such a way that the cam exerted a strain upon one end of each of the starwheel faces. This was tantamount to imperfect seating and prevented the campin from engaging the starwheel slots smoothly.

The clamp and cover-retaining screws (operating side) were tight. Since this was the case, the movement would have continued to operate for a long time; but the starwheel would have eventually worn out. The solution was to remove the movement from the projector and readjust the star and cam for smooth, noiseless operation. The procedure is as follows:

After the intermittent movement has been taken out of the machine, drain the oil from the case. Hold the movement in the left hand in its normal position, the oil tube projecting up verti cally. Then, by means of the flywheel, bring the movement into "locked" position (sprocket "at rest").

With a screwdriver held in the right hand, loosen all of the clamping and cover-retaining screws about one turn. The arm or bracket containing the starwheel-and-sprocket shaft will then of its own weight bring the starwheel snugly against the surface of the cam. Test the sprocket with the fingers to make certain there is no backlash between star and cam. The sprocket should not rock when the intermittent is in a locked position.

Tighten the cover screws and turn the flywheel with the fingers to detect any possible binding of the star against the cam. If any binding is felt, loosen the screws a trifle to allow for binding space, then retighten. Also, there should be no perceptible "click" when the sprocket starts to move.

Replace the movement in the projector according to the manufacturer's instructions for double-bearing movements (see the Super Simplex instruction manual, pp. 16 and 17), turn the projector with the handwheel to see that there is no binding, and then switch the motor on. If the movement is silent with the gate door open, turn the motor off and refill the intermittent oil well with fresh projector oil.

Big Hardtop Chains Still Shy of Drive-Ins

Considering the tremendous growth of drive-ins over the past few years, it is surprising in a sense that so few of the large indoor circuits have entered this lucrative field. In another sense, it is not surprising at all; that is, in the light of the government's anti-trust restrictions against some of the big hardtop theatre chains.

It will be recalled that legal pressure not too long ago brought about first the divorcement of the major Hollywood studios and their theatres, and then a curtailment of the alleged monopolistic activities of the newly independent theatre circuits. While these circuits, therefore, have been for the most part reluctant to expand their holdings into the drive-in field, a new phenomenon in the form of the independent drive-in circuit has sprung into being. These are growing bigger all the time.

Most Are Independent

Out of approximately 4,600 drive-in theatres throughout the U.S., only 61 are in any way connected with the big indoor circuits currently chafing under the limitations imposed on them by anti-trust rulings. This leaves the bulk of the outdoor operation in the hands of a new group of independent owners, some of whom have already created giant chains.

Drive-in circuits may include only drive-ins or drive-ins as well as four-wall theatres. Furthermore, there are those circuits that concentrate their units in one specific part of the country, while there are those that are more widespread in their choice of sites. The operations of outdoor circuits vary extremely.

Among the leading open-air circuits are the Smith Management Corp. with 42 drive-ins in New England and the mid-West; the Daytz Theatre Enterprises Corp., operating 46 outdoor units in the north-east section of the country; Martin Theatres of Georgia, Inc., which has 34 drive-ins out of 135 theatres in three Southern states; and Rowley United Theatres, with 38 drive-ins out of a total of 143 theatres in Texas. Texas, incidentally, is far and away the leader in open-air operations with 547; North Carolina is second with 367, followed by Georgia with 329. In the north, New York is the leader with 294 outdoor theatres. All the major drive-in circuits throughout the country are still undergoing expansion.

It has been estimated that as much as 25% of the total revenue of theatre operations in the U.S. is being gleaned by the drive-ins. The large indoor circuits are well aware of this lucrative branch of exhibition, but for the moment they are not doing too much about it. The time may come, however, and it may come very soon, when they will jump with both feet into the drive-in jackpot. Loew's Theatres recently opened its fourth drive-in, a 1,000-car project, in Keyport, N. J., and is carefully considering other sites with a hopeful eye out for permission from the Department of Justice to go ahead and build.

Altec to Service 96 Theatres

The Altec Service Co. recently completed negotiations with United California Theatres, Inc. providing for the servicing of optical and magnetic sound equipment for 96 United theatres.

Muted Colors in "Moby Dick"

Black-and-white and color negatives were printed together to obtain an unusual, somber effect in the release print.

By NORMAN WASSERMAN

WITH the premiere of the British-made Moulin production of "Moby Dick" in New Bedford, Mass., a few weeks ago, not only was the screen world enriched by the arrival of a great movie, but in addition a possible solution was offered to the growing controversy concerning the relative merits of color versus black-and-white on the wide screen.

There are those who insist that the wide screen must present panoramic views in the most natural way and requires full natural color. On the other hand, there are the proponents of black-and-white for wide screens, who argue that color detracts from the emotional impact of many screened dramas.

In Warner's $5,000,000 "Moby Dick," there may be a common meeting ground for both these points of view, because the film is not full color as we are accustomed to it today, nor is it black-and-white. The new technique in "Moby Dick" is actually a blending of color and black-and-white, producing something quite unique in screen hues.

Credit for the new way of handling color should go to Oswald Morris, director of photography, and to producer-director John Huston. Morris and Huston felt from the beginning that the picture required a special treatment because of its mood, its locale, and the period when the action in the film took place. They were faced with three major problems. Firstly, to capture the proper atmosphere, a delicate blend of realism and fantasy was needed. Secondly, as the story is basically a tale of adventure about tough men fighting giant whales, the color in the photography could not be "soft" or pastel. Finally, there was the desire to transport the viewer back in time to the actual period of "Moby Dick," 113 years ago.

The ordinary color techniques, they decided, would not achieve the proper effects. Following a long series of experiments involving still photographs taken in color on location and put through many different laboratory tests, the long-sought-for results were achieved. These results, emphasized tones and contrasting tonal values rather than full-bodied colors.

Two Negatives Used

The new process, as it was used in "Moby Dick," involved initial camerawork in Technicolor with Eastman film. In development, two different sets of negative films were made. One of the negatives was in color, while the other was black-and-white. Both these negatives were then printed together, one on top of the other with exact registration, and the resulting print is the one currently being shown in theatres throughout the nation.

The combination of black-and-white with primary colors is not an unknown technique in certain crafts. It is probably most common to book and magazine printers. However, until "Moby Dick," it had never been used successfully in making motion pictures. Comparing printing on paper and film printing, the black-and-white film is the equivalent of the black plate in paper printing. Both achieve the same result in that they hold the bright colors inside a framework, and also give to the final print a solidity that primary colors alone lack.

The color is always present in "Moby Dick," but it is a toned down color that does not detract from the interest of the drama being portrayed. The atmosphere of whale hunts, salt sea air, hard-driving men, and the whaling town of New Bedford of 1843 is rendered with a vividness reminiscent of the original book. Also, the ominous mood that prevails throughout the entire picture owes much of its effectiveness to this method of handling color.

Both the indoor and outdoor sequences of "Moby Dick" carry with them a certain unreal reality. The underlying emotional impact of each scene is thereby greatly magnified, whether the scene is that of the giant white whale crushing the tiny harpoon boats or that of our first view of the tattooed cannibal, Queequeg, in a dimly-lit bedroom.

The bright gay colors of an "Okla-

(*Continued on page* 29)

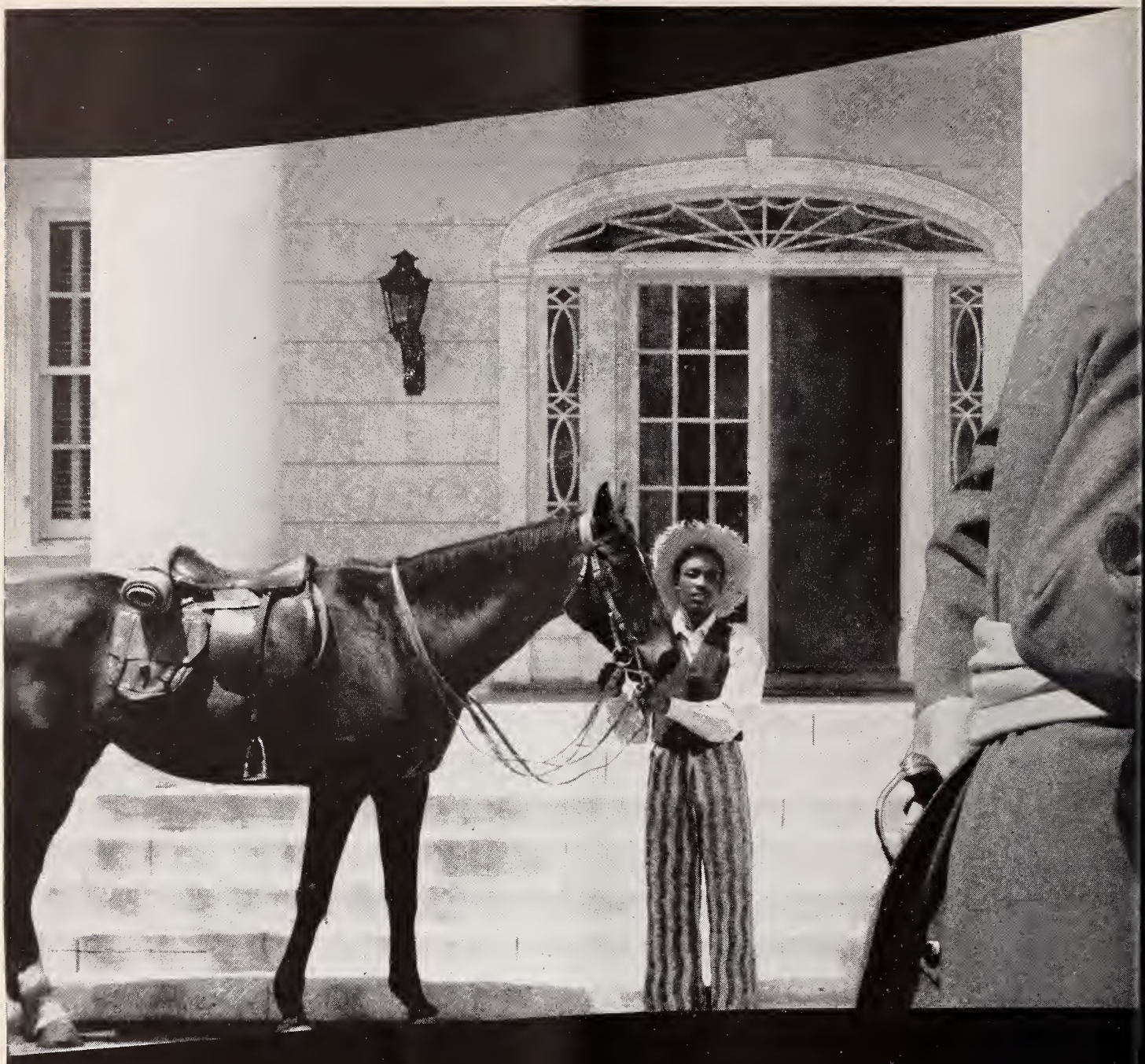
Black-and-White Films Staging "Comeback"

In the wake of the big color splurge of recent years, comes now the realization on the part of the major Hollywood studios that some pictures are better off filmed in good old black-and-white. This attitude is sharply reflected in the number of features, 96, currently being produced in black-and-white, as against 115 now under the cameras in color. Perhaps more significant is the revelation that even a couple of CinemaScope pictures are undergoing the monochrome treatment.

It will be remembered that with the introduction of widescreen and CinemaScope, color received its biggest shot in the arm. This trend now seems to be reversing itself, not only in regard to "small" pictures but major productions as well. At least two of the leading studios, Columbia and United Artists, are currently making more black-and-white than they are color features. Columbia's schedule calls for twelve out of 27 films in color, while UA is planning ten out of its 41 productions in tint. The first CinemaScope offering in black-and-white will be Metro's "The Power and the Prize," now under production. Even 20th-Fox has jumped back across the color line with its forthcoming CinemaScope "Teenage Rebel."

The swing back to monochrome has a twofold explanation. Firstly, there is the apparent economic reason. It is considerably more expensive to make a color film than it is to make a black-and-white, and with boxoffices not doing as well as they have been, producers are watching their budgets with a more wary eye.

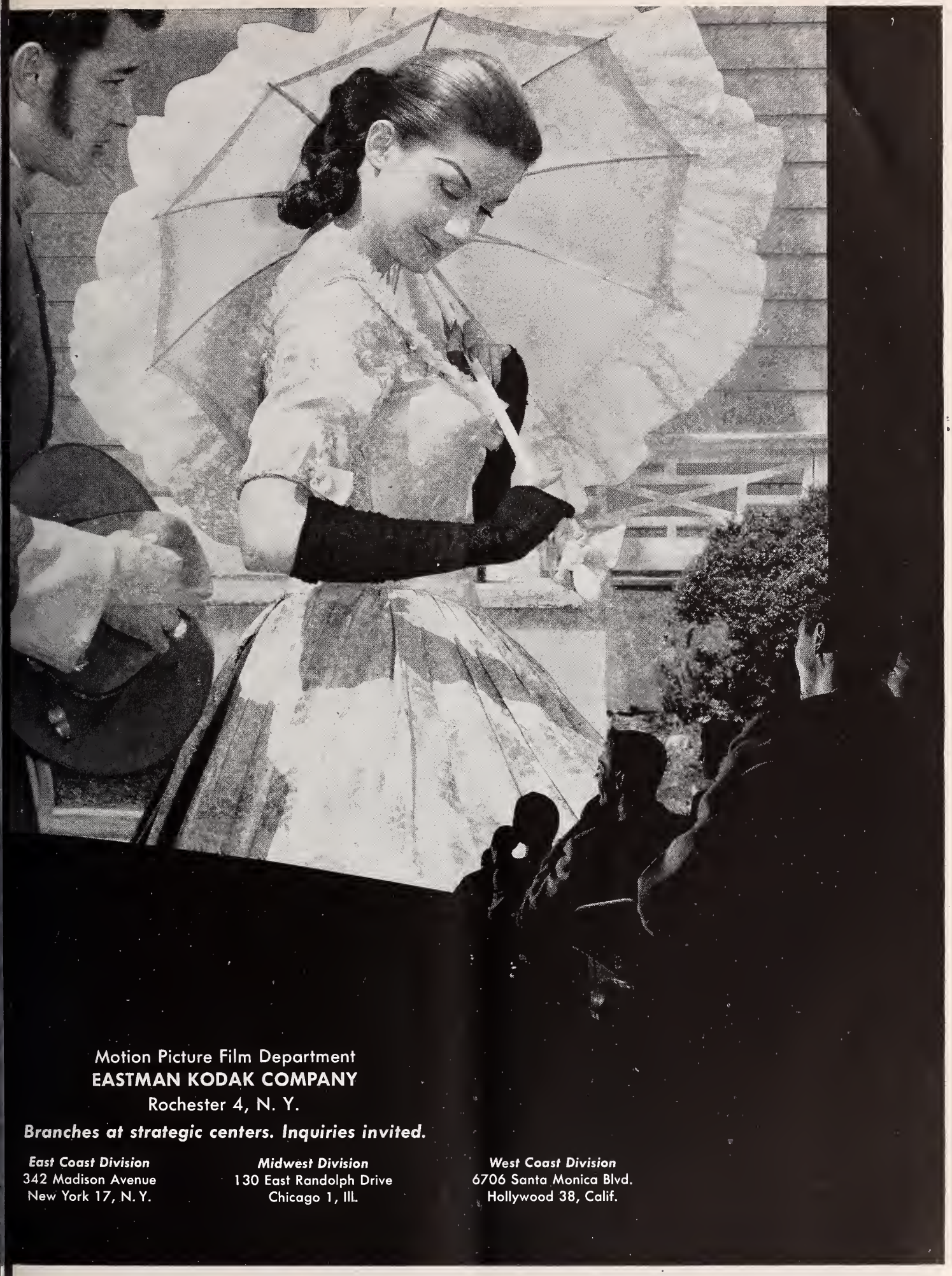
The other reason, less obviously economic, has to do with the recent success of the "small," non-spectacular, black-and-white film, "Marty" being the most notable example of this species. Producers are now becoming more aware than ever that a growing segment of the public chooses its motion picture fare on the basis of content and not necessarily on the basis of external trappings. Furthermore, what Hollywood is now beginning to understand is that a particular picture can be improved by *omitting* color, in the same way that another picture will best realize its potential through the use of color.



Romance never dies

on the wide, wide-screen

Audiences truly live the lives and loves of their favorites as they see them on the wide, wide-screen. For here, as they sit in the theatre, is escape . . . freedom from the humdrum. New technics in production, processing and projection are responsible . . . new horizons achieved by an ever-searching industry working in co-operation with the Eastman Technical Service for Motion Picture Film.



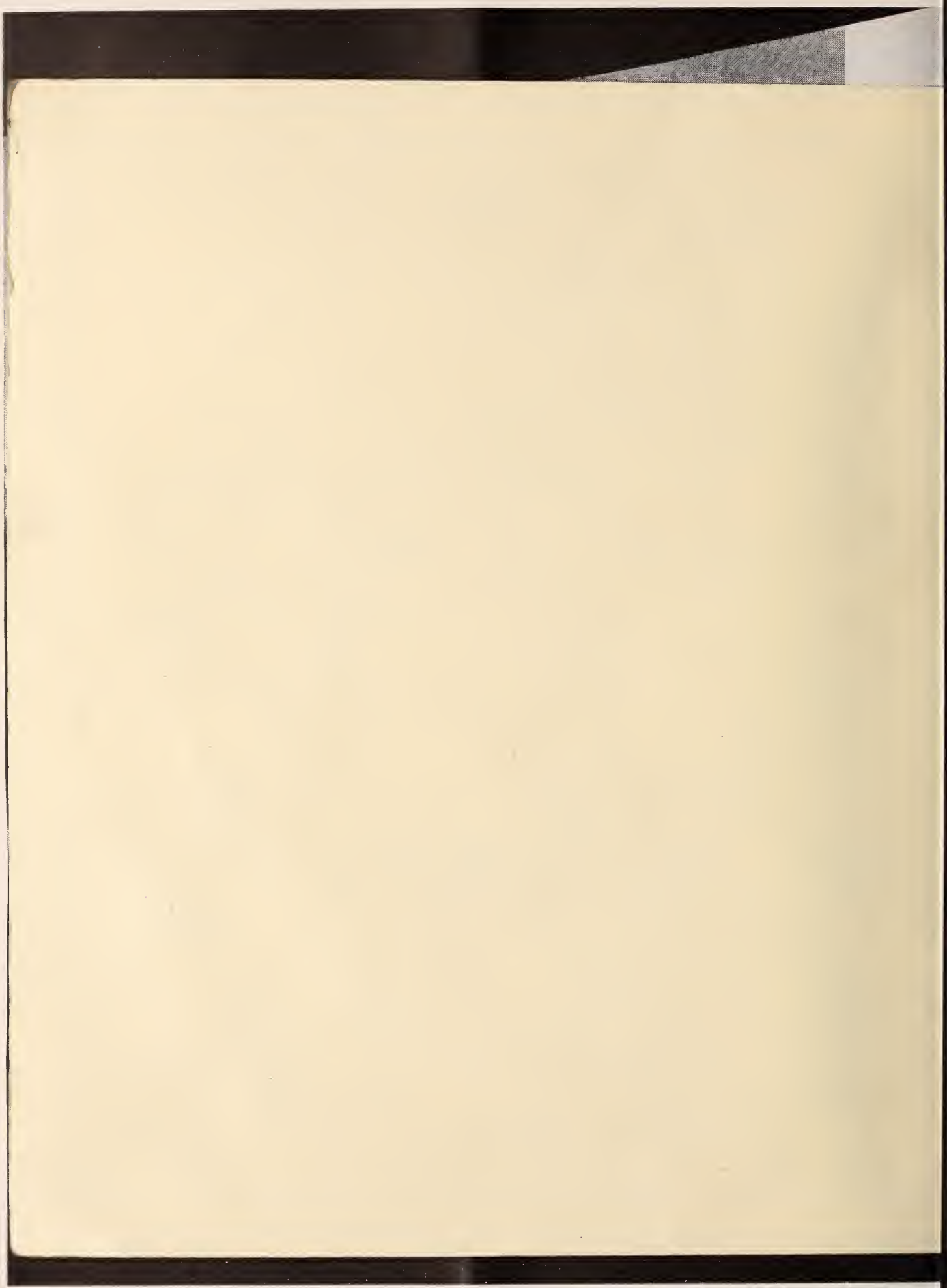
Motion Picture Film Department
EASTMAN KODAK COMPANY
Rochester 4, N. Y.

Branches at strategic centers. Inquiries invited.

East Coast Division
342 Madison Avenue
New York 17, N. Y.

Midwest Division
130 East Randolph Drive
Chicago 1, Ill.

West Coast Division
6706 Santa Monica Blvd.
Hollywood 38, Calif.





Romance never dies

on the wide, wide-screen

Audiences truly live the lives ond loves of their fovorites os they see them on the wide, wide-screen. For here, os they sit in the theotre, is escope . . . freedom from the humdrum. New technics in production, processing ond projection ore responsible . . . new horizons ochieved by on ever-seorching industry working in co-operotion with the Eostmon Technicol Service for Motion Picture Film.

Motion Picture Film Deportment
EASTMAN KODAK COMPANY
Rochester 4, N. Y.

Branches at strategic centers. Inquiries invited.

East Coast Division
342 Modison Avenue
New York 17, N. Y.

Midwest Division
130 Eost Rondolph Drive
Chicogo 1, Ill.

West Coast Division
6706 Sonto Monico Blvd.
Hollywood 38, Colif.

In The SPOTLIGHT

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

AN IMPORTANT part of every skilled craft is training, practice, and study of the basic fundamentals and various subtleties that go into making a skilled craft what it is. The highly-precisioned projectionist knows this perhaps better than most other craftsmen. All craftsmen worthy of the name are unionists, and unionism also takes training and practice and study. The skills of collective bargaining, organizing, and contract negotiation, to mention just a few, are as complex and delicate as anything we might imagine.

To help develop more skilled unionists, each year throughout the country a number of study groups are arranged. The AFL-CIO Department of Education is an important force behind many of these study groups, of which more than 100 have been scheduled for 1956. An estimated 7500 workers representing a broad cross-section of American unions, will attend these classes and seminars in various schools throughout the country.

Training at the "union institutes" include lectures—which may be held at such diverse sites as lake fronts and formal classrooms — panel discussions, and actual workshop sessions. The "students" read important pamphlets and write reports, prepare leaflets and newspapers, debate in mock negotiation and arbitration meetings, and also thrash out vital political issues.

Not only do the graduates of these study groups acquire a greater knowledge of the labor movement in general and a good grasp of the specific activities of union operation, but even more important, they go away with a deeper understanding of what unions mean to the average worker. The "union institute" is one of the lesser known triumphs of American unionism, yet in the long run, through developing more capable leaders, it may very well be one of the more significant triumphs.

• Albert M. Cox, business representative and charter member of Local 605, Visalia, Calif., has an almost perfect record for attendance at union meetings. In the last 35 years he attended all but three meetings of the Local.

Albert Cox's career in show business began in the Fall of 1907, when he worked in the "cracker-box booth" of a storeroom theatre in Eureka, Ark., his home town, for the munificent sum of $1 per night. The theatre ran advertising slides for the local barbershops, bathhouses, and laundries, payment for which was made "in trade." This "in trade" payment was shared by both Cox and the theatre manager. Moving on to Red Oak, Iowa, Cox worked there for the Comet Amusement Co., and in 1911 he got a job at the Yale Theatre in Muskogee, Okla. His next stop was Porterville, Calif., where he worked in both the old Majestic and American Theatres, later moving on to Fresno. In September, 1915 he was called to Visalia, Calif., for the opening of the Visalia Theatre where he remained until 1929 when he transferred to the Fox Theatre, where he has remained ever since.



Albert M. Cox, president and business representative, Local 605, Visalia, Calif.

Cox helped organize Visalia Local 605, which was chartered February 12, 1920, and has held office for 32 years. He is presently serving in the dual capacity of president and business representative. In 1951 he was presented with a gold life membership card in appreciation for outstanding service to the Local. Today, at 65, Cox is still going strong and in addition to his Local duties, he is actively interested in the California State Theatrical Federation, in which he serves as a member of the executive council.

• Morris Klapholz, member of New York Local 306 and recording-secretary of the 25-30 Club, was presented last month with an honorary card in NATKE (National Association of Theatrical and Kine Employees), British counterpart of our own IATSE. The award was made in appreciation of Klapholz' sustained interest in and good will toward his brother craftsmen overseas.

• George Meany, president of the AFL-CIO, will be one of the principal speakers at the IA's 43rd biennial convention opening in Kansas City, Mo., the week beginning August 20. Since this will be the first IA convention since the AFL-CIO merger, it is expected that Meany's speech will contain a great deal of information about the present status and future plans of the united labor movement. During the past year, he and IA President Walsh have been closely associated on the AFL-CIO executive council.

• The appearance in these columns recently of an item relating to the copper drippings campaign sponsored by the 25-30 Club for the benefit of the Will Rogers Memorial Hospital, prompted a number of letters to IP from IA Locals that have inaugurated similar drives. Representative of most of these communications is the following from A. Ray Mercer, secretary of Local 653, Lorain, Ohio:

"About two years ago Local 653 instituted a 'save copper drippings' campaign. With the cooperation of the managers, we collected enough drippings to realize a sale of $135.25, which was donated to the Will Rogers Hospital in the name of the theatres that took part in the drive.

"Our procedure for collecting the drippings was very simple: From time to time I would stop at the different theatres and pick up the accumulated drippings, storing them in the trunk of my car until I had a sizable amount. (Incidentally, I found spare trailer cans a dandy container for the drippings.) I watched the

scrap copper quotations in the daily newspapers and contacted a local brass foundry that gave me from two to three cents more per pound than the scrap metal dealers. I sold the drippings for 30c per pound—the highest price quoted at that time.

"We plan to continue with this program, following the procedure outlined above. However, any suggestions for improving our collection methods will be very much appreciated."

• M. D. O'Brien, director of visual and sound projection for Loew's, Inc., has retired after 30 years with the company and is now making his home in North Miami Beach, Fla. Oby plans to take things pretty easy from here on in and will accept assignments on a consultant basis only.

John Kohler, former assistant director, has been appointed to the post vacated by Oby.

• The Coleman Electric Co. (Celco) of Toronto, Ont., headed by Harry Coleman, member and former business representative for Local 173, closed its doors last month after having served the industry for the past 41 years. Coleman entered the theatre supply business several years after his graduation in 1913 from the



•

Harry Coleman, member, Local 173, Toronto, Ont., Canada

University of Toronto as an electrical engineer. He not only manufactured various electrical items on his own but he had the exclusive distributorship in his district for a number of leading projection equipment manufacturers. The name of Coleman electric became very well known and the firm enjoyed great popularity in the theatre field, for Harry Coleman's sound advice on industry matters was eagerly sought by exhibitors and projectionists alike. He is still actively engaged in projection work, operating in one of the largest drive-in theatres in the Local's jurisdiction.

• The New York State Ass'n of Motion Picture Projectionists held a special meeting in Syracuse, N. Y., last month for the purpose of discussing the reported efforts by the Schine Circuit management to reduce projection room manpower in its theatres from two to one man. The meeting was attended by representatives from IA Locals in various cities upstate New York, where many of the Schine theatres are located.

It was reported at the meeting that the circuit gave the Locals the alernative of either cutting down the projection room manpower or be faced with curtailed theatre operating hours. After much deliberation the Association members unanimously agreed to vigorously oppose any reduction of manpower and came to the following conclusion: "There shall be no reduction in the number of men used in the projection room. If a theatre decides to curtail its operating hours, a new policy is inaugurated and a scale to compensate for this new policy must be negotiated."

• A note from our good friend, Lou Walters, member of Dallas Local 249, reminds us that his new projector repair shop at 8548 San Fernando Way is now open for business. An old hand at servicing projection equipment, Walters recently completed 20 years' service with a leading theatre supply house and is familiar with all makes of projectors, arc lamps, *etc.* In addition to his membership in the Dallas Local, he holds a gold card in St. Louis Local 143, and is a member of the SMPTE.

• The infamous "right-to-work" statute received another setback when the people in the state of Montana overwhelmingly rejected a petition to place this bill on the ballots. State labor organizations and many prominent civic-minded citizens not associated with unions joined forces in killing this proposal. Of the 20,000 signatures necessary to place the bill on the ballot, the backers were able to obtain less than 5,000 names.

• Freeman H. Owens, old-time projectionist from the Chicago area, paid us a friendly unexpected visit recently in search of information on projection equipment. At 66, Owens looks as young as ever after recuperating in the hospital following a nasty fall. Like many projectionists, Owens is an inveterate inventor, but few if any can boast of his record of more than 200 different patents he has registered under his name. Of course, he is still inventing, his present project being shrouded in darkest secrecy. During his visit here he showed us a few frames of rare Spoor 63-mm film, which contained some amazingly clear shots of Niagara Falls.

• In a recent election conducted by the National Labor Relations Board, the members of TV Locals 794 (New York) and 819 (Washington, D. C.) overwhelmingly chose the IATSE as their bargaining agent. This election was made necessary when NABET claimed it represented a majority of the technical personnel at Du Mont TV stations WABD in New York and WTTG in Washington. As a result of this vote of confidence, the IA negotiated new contracts providing substantial wage increases plus additional benefits for engineers and other technicians employed by the Du Mont Broadcasting Corporation. Also, under the new agreement, arbitration may be called for by either the employer or the union. Previously, arbitration had to be by mutual consent.

IA Representatives John J. Francavilla and Richard Scott headed the group negotiating for the Alliance.

• They not only grow them tall and handsome in Texas but talented as well. For proof, we present Jimmy Duncan, 25, member of Houston Local 279 and projectionist since his teen-age days at the Houston Theatre. While working in the theatre, Jimmy composed more than 300 songs—his secret ambition then was to be a successful song-writer.

It wasn't until a Houston disk-jockey persuaded Jimmy to cut some sides for the Cue Label that a vocal career occurred to him. He had never considered singing professionally but he was encouraged by such well-known personalities in the music world as Frankie Laine and Johnny Lange (composer of



•

Jimmy Duncan, member, Local 279, Houston, Texas.

"Mule Train") to cut two of his own tunes for Cue Labels — "Goodbye To Love" and "I Asked The Lord." The record did well enough to stimulate heavy cover action by major labels and Jimmy received offers of contracts from larger recording companies. However, he preferred to remain with Cue where he had a much better chance of cutting his own material.

His second release, an original called "Here I Am," was a smash hit and established Jimmy Duncan as one of the most promising new singing talents on the musical horizon today. Recently he also recorded several of his songs with the Buddy Bregman orchestra. It looks like Jimmy Duncan is another IA man with stardust in his eyes.

Columbia Asks Projectionists for Help

HOLLYWOOD studios are showing an increasing awareness of the technical problems faced by theatre projectionists. Columbia Pictures, for instance, is currently distributing a pamphlet to theatres that asks the assistance of projectionists and frankly states that a high-quality screen image is no easy thing to achieve on today's king-size screens. Part of the statement contained in the pamphlet is as follows:

"We realize that, with the large screen areas on which we are asking you to put a picture, you must operate at the very peak of efficiency because the sharpness of the small image on the film and the amount of light which you can get through present-day apertures does not leave any room for losses anywhere in the projection room.

". . . Until we can provide better film images, more efficient light sources, better projection lenses, and more precise focusing mounts, we need your help in operating the present equipment at the peak of its performance so that we do not discourage the motion picture audience from coming to see our product."

Suggested Practice

Four suggestions are given in the pamphlet for keeping projection equipment at top efficiency. Although the information is certainly not new to readers of IP, the suggestions are well worth repeating because the situation is serious. They are:

(1) To get the maximum light output from your projector, the alignment of your optical system must be checked from time to time because intermittent heating and cooling of the equipment causes parts to distort and warp, disturbing the alignment. Faulty alignment can cause light losses of as much as 50% over a four-to six-month period.

(2) Keep the surfaces of reflectors, condensers, and port glasses clean. A very thin film of airborne grease on one of these surfaces can cut the light output by as much as 25%, causing a flare in the picture and reducing sharpness.

(3) Keep watching focus. Whenever you start a projector at changeover, the entire machine has cooled since its previous run, and the focus in which you left it at the end of the previous reel will no longer be effective. At each changeover, the new reel must be carefully focused. In addition, as the machine heats up alignments and distances begin to change, making it necessary to follow focus during the first 200 or 300 feet of a reel. Generally, it can he said that focus will continually change until the machine and the optical parts have come up to operating temperature. Very frequently, reels go out of focus about one-third of the way through their run for this reason.

(4) It should be possible to hear the sound well from any part of the theatre. Horns must be positioned to obtain the best distribution of both high and low frequencies of the sound output. Clean sound optics in the projector or clean magnetic heads which are not too badly worn are a necessity, as is changeover equipment which does not arc or bump.

The pamphlet also had something to say on the question of print density. Columbia makes its black-and-white and color prints, it was stated, at densities which try to average out the requirements of the bright screens of first-run theatres and the low-light-level large screens at some of the big drive-ins. The studio adds that it has not been able to work out a practical method of making special prints to cover these different situations, but that it is continuing to search for a solution to the problem.

Critical Heat Problem

Another indication of Hollywood concern over theatre technical needs was given in a talk by Dr. Charles R. Daily, optical expert for Paramount Pictures, before a recent meeting in New York City of the Film Projection Practices Committee of the Society of Motion Picture and Television Engineers.

Dr. Daily told the committee that he considered the future of black-and-white motion pictures to be in doubt. He described the situation as one in which growing light-intensity requirements, called by him an irresistible force, were clashing with an immovable object—the maximum heat absorption of which film is capable. The heat problem is more critical in large theatres with black-and-white film than with color because black-and-white film absorbs more heat in projection and, therefore, has a greater tendency to buckle and blister.

Bigger Film Image

In addition to Dr. Daily's remarks, a considerable portion of the meeting was devoted to a general discussion of the heat-on-film problem. Wilton Holm of the Du Pont Company also noted that the basic problem is one of light requirements *versus* overheating of the film. Holm observed that, no matter what technique or combination of techniques is employed, there is a limit to the amount of light that can be passed through a film even when filters and other cooling means are employed. He felt that the only real solution lies in increasing the size of the film image through the use of a print film wider than 35 mm.

Another member of the committee, Hugh McLachlan, technical supervisor for Y & W Theatres, a Midwest circuit, stated that the conditions of film buckling and blistering had been considerably reduced at these theatres by the following means:

(1) Keeping the projection room temperature at or below 76 degrees.

(2) Circulating cold water in the water-cooling system.

(3) Directing cold air between the lens and the lens mount.

(4) Cooling the film prior to projection.

Projection Experts Invited to Lively TESMA Forum

The annual equipment showmanship forum conducted by the Theater Equipment and Supply Manufacturers Association will take place on Saturday morning, September 22, 1956, on the fourth floor of the New York Coliseum as part of the TESMA convention and trade show. Don H. Hyndman, Eastman Kodak Co., will be moderator of the forum, while Martin Wolf of Altec will be the keynote speaker. Expected to attend are members of the Theatre Owners of America and a variety of theatre technicians. Projectionists will be most welcome at the forum.

Among the subjects to be discussed are servicing, projection, arc lamps, optical and magnetic sound, 55-mm and 65-mm projection for road show presentations, and many others.

TESMA committee men Jack Nolan of National Carbon Co. and Larry Davee of Century Projector Co. have invited an imposing list of theatre equipment experts to become members of the panel. Following is a rundown of those who have been asked to participate: Ben Schlanger, theatre architect; Earl Sponable, chief engineer, 20th-Fox; Leonard Satz, Raytone Screen Co.; Francis Keilhack, Drive-In Theatre Manufacturing Co.; Arthur Hatch, president, Strong Electric Corp.; Loren Ryder, chief engineer at Paramount; J. F. O'Brien of RCA; Frank Cahill of Warner Bros.; M. H. Stevens, Bausch & Lomb Optical Co.; Wentworth Fling chief engineer, Cinerama Corp., and Douglas Shearer, head of projection and sound at MGM. Larry Davee will also be on the panel.

Joseph Zaro, Bijou Amusement Corp., is being asked to represent the Theatre Owners of America and J. Eldon Peek, of the Oklahoma Theatre Supply, will represent the Theatre Equipment Dealers Association.

LETTERS TO THE EDITOR

Exchange Splicing Methods

To the Editor of IP:

When will the day come when the film exchanges will realize that these curved splices are not what they are cracked up to be? I am informed that these splices are made on new automatic equipment which is greatly favored by the exchanges over the old method of manual splicing with standard splicers.

These automatic splicers may save labor at the exchanges, but they certainly create headaches for the projectionist. Just recently, we received an older print from one of the larger companies to run for a special kids' show. This picture broke six times in the five reels that comprised it, and all the breaks were on curved splices. Can't something be done?

Oakland, Calif. DENNIS LEWIS

COMMENT: Those curved splices have always been a headache to projectionists. There are semi-automatic splicers for *straight* splices, too! No one seems to know what advantage (if any) a curved splice possesses. After all, only the perforation margins of film contact any part of a projector; and the amount of curvature in the margin areas of a curved splice is slight indeed.

Even *straight* hairline, or negative, splices in release prints have been under fire, although they are strong enough if properly made on heated, high-pressure splicers. But the emulsion must be scraped off the stub (accomplished by an automatic abrader) and film cement must be applied. Sometimes the automatic scraper does its job poorly, and many times the exchange inspectress uses film cement as if it were as rare and precious as nectar.

To make a strong splice—by hand, on a projection-room splicing block, or with an automatic studio splicer—film cement must be applied to the scraped stub *liberally*. Better too much than too little, in fact. The cement is what sticks the film together!

The crux of the matter is simply this: *Can* the average exchange inspectress make a strong projection-print splice? If her technique is the least bit faulty, then she should certainly stick (no pun intended) to regular 1-hole positive splices and leave those hairline things, curved or otherwise, strictly alone.

In certain exchanges, however, faulty splicing is not the fault of the girls. They may *know* how to make perfect splices—but they just don't get the chance! Forced to turn out at least five times more footage per working day than Superman could adequately inspect and repair, splices are skipped over hastily.

"If they hold during rewinding, maybe they won't come apart during projection—maybe."

But they often *do* come apart during projection—or would, if we projectionists didn't repair them before the film is shown! We grumble at those obviously uninspected reels containing yards of torn film and dozens of broken splices; but the fault often lies, not with the celluloid-spinning lovelies, but with exchange managers who crack the whip to meet bookings. The agonies of projectionists mean little to exchange managers who have to fill several hundred play-dates with a dozen prints.

"I don't care how you do it! Just get those prints into the shipping room before two o'clock!"

And so the girls whirl the reels faster and faster and use the splicer less and less. The inspection stickers mean nothing: reels 3 and 4 of "The Mischievous Mistress" may not even have been inspected at all. Is it any wonder that the splices come apart?

One or two bad exchanges in a district unfortunately earn a bad name for all the rest. Let's not forget the good exchanges—those whose managers insist upon expert print repair and provide adequate time for the work to be done. Such exchanges are not likely to use curved splices.

About Mirror Anamorphots

To the Editor of IP:

With much interest we read the article in the June, 1956, issue entitled "A Common Sense Approach to Screens, Apertures and Aspect Ratios," by Robert A. Mitchell.

Referring to the statement in this article about the light transmission of cylindrical-mirror anamorphots, we wish to remark that nowadays light losses in these anamorphots are about 10%, or of the same magnitude as the losses encountered in cylindrical-lens anamorphots.

The vacuum deposited aluminum mirrors are coated with reflective-increasing interference layers, so that a reflectivity of 95% per mirror surface is obtained. These layers form at the same time an adequate protection for the front surface mirror because their hardness is equal to that of the well-known reflection-reducing layers on lens surfaces.

You will appreciate that this small light loss in cylindrical-mirror anamorphots, combined with the other obvious advantages, as for example freedom from chromatic aberrations, forms a valuable asset of this type of anamorphot.

We would sincerely appreciate it if you could correct this statement made in the article mentioned above that the use of cylindrical-mirror anamorphots occasions light losses of from 30 to 40%.

J. J. VAN DER SANDE

Old Delft Optical Co., Inc.
New York, N. Y.

COMMENT: The success of the Old Delft Optical Co., of Holland, in reducing the light losses of mirror anamorphots is welcome news to users of this type of attachment for the projection of CinemaScope prints. Mirror anamorphots are free from chromatic aberration even though they possess certain disadvantages which have been pointed out in the literature, particularly by German writers.

The German firm of Zeiss Ikon reports an *average* mirror-anamorphot light loss of 29% (*Bild und Ton*, March 1955, page 5). It is pointed out in this connection that a corresponding increase in arc amperage and operating costs is occasioned by anamorphots of this type. Moreover, specially positioned projector portholes are required because of the physical dimensions of these attachments.

Mr. Mitchell, author of the article entitled "A Common Sense Approach to Screens, Apertures, and Aspect Ratios," maintains that the 30 to 40% light-loss estimate is correct for the average commercial mirror anamorphot, particularly the earlier ones, but is most happy to concede that the mirror anamorphot attachments produced by the old and highly respected firm of Old Delft reduce light losses to minimal values.

In regard to this, however, Mr. Mitchell feels very strongly that an asserted light loss as low as 5% per surface attributes a higher reflective power to vacuum-deposited aluminum than this metallic film actually possesses. The use of interference layers to increase the reflectance of a *metallic* surface is unknown to Mr. Mitchell.

Early Projector Memories

To the Editor of IP:

Upon turning to page 17 of the June issue of IP, I was surprised and delighted to see the letter and picture that was submitted of an old German-made projector.

Just 40 years ago when, I was an eight-year-old boy in London, I had one of the greatest thrills of my life when my father presented me with an exact duplicate of that machine. In England, of course, it was called a "Cinematograph" and was complete with the same oil lamp. I later replaced the lamp with an electric bulb and socket and installed a screen on the wall with black painted border. There are happy memories indeed of the many

(*Continued on page* 28)

Brushup on Fundamentals

IV

How well do you understand Ohm's law?

We have considered the three most important electrical quantities, namely, volts, amperes, and ohms. All three have a definite relation to each other. The man who first discovered this relationship was Georg Ohm, and he was able to prove this relationship mathematically and the formulas which he derived bear his name. This group of formulas is known as Ohm's Law.

Ohm's Law states that the current in an electrical circuit is directly proportional to the voltage and is inversely proportional to the resistance. To put this mathematical statement into simple English we merely say that whenever the voltage in a circuit is increased, the current will also increase provided that the resistance remains constant. Several such simple statements are possible. For example, if the voltage is held constant but the resistance is increased, the current will decrease. Ohm's Law is of little value to us unless we know how to use it in the mathematical sense. Three formulas are used in Ohm's Law although they are all simple variations of only one.

The first statement of Ohm's Law says that the current in a circuit is equal to the voltage across the circuit divided by the resistance of the circuit. The second statement of Ohm's Law is that the resistance in a circuit is equal to the voltage of the circuit divided by the current through the circuit. The last statement of Ohm's Law says that the voltage in a circuit is equal to the current multiplied by the resistance in the circuit. Ohm's Law rarely appears in books in the form of a statement, but rather, as a formula. In the formula, E stands for voltage because it is the first letter of the word electro-motive force; R stands for resistance because the word begins with the letter R. For current the letter I is used because it stands for intensity of electron flow. You may ask why the letter C was not chosen. The answer is that C is already being used for capacitance and further use of that letter would create confusion.

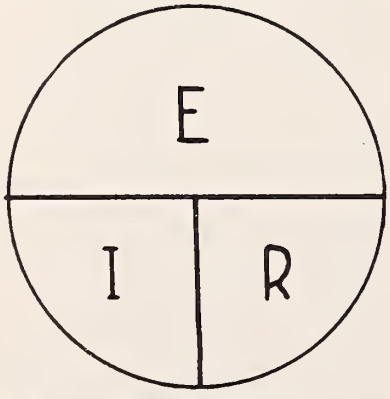


FIG. 9. Simple means for finding the proper Ohm's Law formula.

In order to use Ohm's Law in a practical manner, we should know how to solve simple problems. The mathematical formula $I = \frac{E}{R}$, is another way of saying $\text{Amps} = \frac{\text{Volts}}{\text{Ohms}}$. The form $R = \frac{E}{I}$ may be written out as follows: $\text{Ohms} = \frac{\text{Volts}}{\text{Amps}}$, and $E = IR$ is the same as Volts = Amps multiplied by Ohms.

How do you put Ohm's Law to use?

We are now ready to solve some problems. Suppose that an electric stove has a resistance of 10 ohms and is connected to the 115-volt mains. Find the current which will flow. Since the current is the unknown quantity, you must solve the problem for I. From the formulas given we see that $I = \frac{E}{R}$. Substituting the known numbers in place of the letters, we get $I = \frac{115}{10}$. Solving this problem gives us the answer 11.5 amperes.

Let us try another problem. Find the voltage drop across a 25-ohm resistor through which flows a 5-ampere current. Since $E = I \times R$, then $E = 5 \times 25$, or 125 volts.

And now let us solve the third problem. A resistor takes 2 amperes when a 6-volt battery is connected to it. Find the value of the resistor. We find that $R = \frac{E}{I}$, and $R = \frac{6}{2}$, therefore the answer is $R = 3$ ohms.

In Figure 9 we have a simple means for finding the proper Ohm's law formula. Cover the unknown quantity with your finger and the remaining letters give the correct formula. Figure 10 gives the electrical symbols for a resistor, a battery, and a generator.

We will now demonstrate how this device actually is used. Let us suppose that a rheostat in a 110-volt circuit causes a current of 5 amperes to flow and it is desired to find what the resistance of the rheostat is under these conditions. In this problem the voltage in the circuit is given as 110 volts and the current is listed as 5 amperes. The resistance of the rheostat obviously is the unknown quantity. Following the instructions given above, cover the unknown quantity which in this case is R. The letters which remain in Fig. 9 are E divided by I, or in other words, voltage divided by current. The voltage in this particular problem is given as 110 volts and the current is 5 amperes. Divide 110 by 5 and you get 22; the answer is, therefore, 22 ohms. Here is an additional problem.

Suppose that a 50-ohm soldering iron is connected to a 100-volt source. How much current will be taken by the iron? Again we refer to Fig. 9. In this problem the unknown quantity is the current, therefore it is necessary to cover up the letter I in order to get the proper formula. When the letter I is covered up the remaining letters are E divided by R. Solving the problem we find that 100 volts divided by 50 ohms equals 2 amps.

Let us consider a third problem. A 100-ohm resistor is found to draw 3 amperes from a certain battery. How many volts are contained in this battery? The unknown quantity in this problem is the voltage E. So we cover up the letter E in Fig. 9, and the remaining letters are amperes multiplied by ohms, or I times R. Solving this problem we have 3 amperes multiplied by 100 ohms, or 300 volts.

In order to gain proficiency in the art of solving these problems it is suggested that the reader try several at home, assigning any number to two of the quantities and finding the unknown.

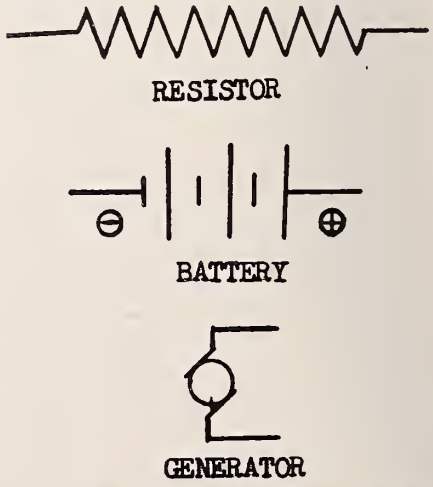


FIG. 10. Electrical symbols for resistor, battery and generator.

PERSONAL NOTES

ABRAHAM FISCHER has been named sales and merchandising manager of RCA Service Company's technical products service department. Fischer has been in the RCA organization for 25 years, previously serving as mobile equipment sales manager and manager of communications commercial operations. Also at RCA, BENJAMIN F. BIBEN was appointed theatre service sales manager of the technical products service department. Biben started with the company in 1929 in theatre service and recently served as manager of technical field service in the Philadelphia district.

* * *

ROSS H. SNYDER has been named manager of the new video sales section of Ampex Corp. Snyder, who has been with Ampex since 1952, will also continue in his previous capacity as manager of theatre equipment and custom products sales for the audio division. CHARLES P. GINSBURG, who was project engineer for the development of the Ampex Videotape recorder since its inception over three years ago, has been appointed chief engineer of the video engineering department.

* * *

MARTIN F. (MARTY) BENNETT has been named vice president, merchandising, for the Radio Corp. of America. Bennett joined RCA in 1946 as a sales staff assistant after a long association with the motion picture industry. He subsequently served as manager of theatre equipment sales, and later as director of RCA regional operations. In his new post of vice president, merchandising, he will be responsible for distribution and regional offices of RCA, advertising and sales promotion, and economic planning.

* * *

CARL L. BAUSCH has been elected chairman of the board of Bausch & Lomb Optical Co., Rochester, N. Y. Recently senior vice-president, he joined the company in 1909 as an apprentice machinist and has risen steadily through the years. He succeeds the late Joseph F. Taylor. At the same time, DR. HOWARD S. COLEMAN, was named vice-president in charge of research and engineering. A physicist, Dr. Coleman directed the development of CinemaScope lenses for Bausch & Lomb, for which the company received an Academy Award earlier this year. He first joined B & L in 1951 as director of the scientific bureau. In his new post, Dr. Coleman will direct research and product development in motion picture optics.



1st Choice
for the PRIME LENS
SUPER SNAPLITE

8 out of 10 Exhibitors today choose a Kollmorgen Super Snaplite for their prime lens. Perhaps this is because for more than thirty years Snaplites have been the standard by which all other lenses have been judged.

For speed, for contrast, for definition and for terrific brilliance on the screen, your 1st Choice is a Super Snaplite.

Write for Bulletin 222.

KOLLMORGEN Optical CORPORATION
NORTHAMPTON, MASSACHUSETTS

Faulty Projection Charge Refuted by Industry

In a strongly worded letter published in the *New York Times*, Charles E. McCarthy, information director of the Council of Motion Picture Organizations, refuted charges made by the *Times* Hollywood correspondent. Thomas Pryor, pointing to "sloppy" theatre operation and faulty projection as chief reasons why people remain away from movies.

McCarthy challenged Pryor's statement that theatre operations have not kept pace with "innovations in picture design," an apparent reference to the innovation of the wide screen. Said McCarthy: "This is obviously preposterous, since the wide screen is essentially a projection development and became of benefit to the public only when thousands of theatres throughout the country invested huge sums in wide-screen installations."

In conclusion, the COMPO executive wrote. "There are many reasons for the present state of the movie industry, television, of course, being the principal one. To single out either producers or exhibitors as the villains is grossly misleading and unfair."

Pryor's charges were contained in one of his recent regular articles for the Sunday *Times*. According to Pryor, Hollywood producers believe "that the theatre operators are not doing their fair share to help make moviegoing an exciting experience for the public." "Absentee showmen," "real estate operators," and "concessionaires" are some of the terms often applied by Hollywood to exhibitors, he said.

Pryor traced, with some truth, the history of marginal theatres that are kept open because realtors appreciate the value of a theatre to a neighborhood. It makes the street look lively, increases traffic, and raises the value of surrounding commercial establishments. Such theatres, because they are not necessarily money makers, are often allowed to go to pot. They become under-staffed, under maintained, and generally uncomfortable. "Faulty projection," Pryor stated, "is a common failing under such circumstances, and this gradually builds up a resistance in people who for one reason or another continue to patronize such theatres and then grumble that the movies are going to the dogs."

An interesting point raised in the article concerns future construction of theatres. No longer will there be built the giant movie palaces that went up in such numbers during the 1920's. Instead, it was asserted, the theatre of the future will probably be a moderate-sized structure with no more than 1,000 seats. It will most likely be erected in suburban areas and provide parking space for several hundred automobiles. Pryor declared that the conventional four-waller is most ideally suited for picture presentation, and that it will not be replaced by the drive-in, despite the recent trend.

Festival of Labor Films

The second International Industrial and Labor Film Festival will be held in Belgium in December, 1956. The purpose of the festival is to bring together outstanding films pertaining to labor and industry. Entries, currently being accepted from all over the world, must have been produced since December, 1952, the time of the first festival.

Cinemiracle Installation

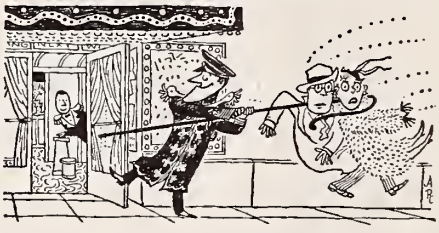
Installation of Cinemiracle portable projection equipment and production apparatus at the Mt. Eden Theatre in New York City is expected to be completed by the end of this month. The Mt. Eden is being used as the production center for this latest of the new screen processes.

Cinemiracle equipment includes a new optical-continuous printer, a specially constructed seven-track RCA sound recording system, and a pair of Cinemiracle cameras manufactured by the Smith Dieterich Corp. Until all the units necessary for full-scale production are installed, a number of short subjects demonstrating the Cinemiracle process will be produced. Training of technicians in the ins and outs of the new process will also be carried out in the interim.

Your decor may dazzle 'em...



Your house-front may invite 'em...



BUT EVERY PERFORMANCE STILL MUST BE PERFECT!

Perfect performances require equipment that's right on the ball through every foot of film. Things are always ready to roll when you deal with an expert RCA Theatre Service Engineer. *Nobody* else has that vital support from all RCA's technical resources.

RCA SERVICE COMPANY, INC.
A Radio Corporation of America Subsidiary — Camden, N. J.

Lorraine DRLUX SUPER-CHARGED LARGE-CORED Carbons
For DRIVE-INS & THEATRES with HUGE, WIDE-AREA SCREENS • CARBONS, Inc. BOONTON, N.J.

Army Improves 16-mm Sound

A "Hi-Fi" pickup system that vastly improves the sound quality of 16-mm projectors has been developed by an army signal corps scientist at Fort Monmouth, N. J. It is claimed that the new system permits comparison between the sound of a 16-mm projector and that of "the best movie house machines."

Edward P. Kennedy, chief of the Fort Monmouth motion picture equipment section, is the person responsible for the new development. Previously, light 16-mm projectors often produced a fluttering, wavering sound. Kennedy's system employs a simple set of rollers and a small, light flywheel which capitalizes on the film's springiness to achieve the required sound regularity.

Rights to the patent, No. 2,721,738, are owned by the government. However, use of the patent is now available to manufacturers who arrange for license agreement with the Army.

Today, more than 20,000 projectors incorporating the system are run by the Army, Navy, and Air Force. A commercial model of the Signal Corps' AN/PFP-1 projector is used extensively by television networks. Kennedy did early work on the system while with the DeVry Corp.

New TV Tube Retains Image

A new television tube, known as the dark trace tube and described as "revolutionary," has been introduced by the Skiatron Electronics & Television Corp. The new product, which is said to have extraordinary pictorial retention, will be used chiefly in closed circuit systems for the transmission of business information via regular telephone wires.

The dark trace tube contains a new-type screen rather than the usual fluorescent screen of the conventional tube. Operation of the tube is as follows: the chemically-treated screen is fired upon by the electronic gun that carries the picture impulses; "color centers" then form on the coating of the screen. When the cathode ray beam is focused through this special screen, a dark image is projected to the receiver. The image is retained until it is "erased" electronically, which can be done in just a fraction of a second.

Distribution of the dark trace tube for commercial purposes began recently with a large shipment to the Dage TV division of Thompson Products, who are set to launch a national campaign to introduce a closed circuit Data-Vision system. U. S. armed services have already used the new tube for a number of purposes, including air traffic control. Weather stations as well as other government agencies are also expected to benefit through use of the tube.

12 Minutes of Todd-AO Thrills

A new 14-minute subject, "The Miracle of Todd-AO," is currently being shown at all theatres throughout the country playing "Oklahoma!" The short, produced by Todd-AO for the Magna Theatre Corp., distributor of "Oklahoma!", is an introduction to the technical capabilities of the Todd-AO process.

It had been felt for a long time that the artistically lovely "Oklahoma!" did not fully exploit the more spectacular potentialities of the curved screen 70-mm process. Patterned on the Cinerama format, "The Miracle of Todd-AO" offers a rollicking roller-coaster ride, a plane flight through mountain canyons, a skillful sequence of skiers skimming down the slopes of Sun Valley, and an exciting motorcycle jaunt through the narrow, hilly streets of San Francisco.

International Show in Germany

"Photokina," the International Photo and Cine exhibition, will be held in Cologne, Germany, from Sept. 29 to Oct. 7, 1956. The displays will include projectors, films, optics, cameras, chemicals, reproducing apparatus, light sources, enlargers, and numerous other items. Representing "Photokina" in the U.S. is the German-American Trade Promotion Office, 350 Fifth Ave., New York City.

Stepped-Up Color Telecasting

At a reported cost of a half million dollars, WRCA-TV in New York City will sharply increase color broadcasting in September. The new Fall schedule calls for 50% of local live programs to be in color, in addition to the regular filmed color programs.



HILUX®

WORLD'S FINEST ANAMORPHIC PROJECTION LENSES!

Comparison tests in famous theaters throughout the world have proven Hilux Anamorphic Projection Lenses vastly superior. Precision designed and built, they have optimum optical correction for color, definition and distortion. You owe it to your audiences to use Hilux Anamorphics for *ALL* prints.

HILUX VAL



An amazingly precise *variable* onomorphic thot gives nan-vignetting perfarmance with *both* 4" (101.6mm) ond 2 25/32" (70.6mm) diameter prime lenses. Complete control up to 2X without shifting lens or projector.

HILUX 264



A high quality 2X *fixed* anomorphic for oll projection lenses up to 2 25/32" (70.6mm) with o 64mm free rear aperture for moximum non-vignetting light trons-mission.

HILUX 152



A 1.5X to 2.0X *variable* onamorphic far all standard 2 25/32" (70.6mm) projection lenses. 64mm free rear aperture assures maximum light with no vignetting.

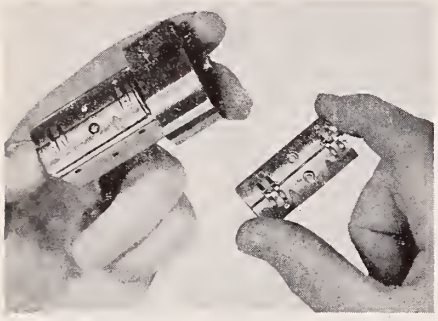
Hilux 264 and 152 are available with either fixed ar variable carrector lenses. Far catalag sheets and facal length camputer, write Dept. P-56.

PROJECTION OPTICS

PROJECTION OPTICS CO., INC.
Rochester, N. Y. • London, England

New Products for the Industry

A REMOVABLE CAP for the replacement of worn magnetic pickup heads is part of a new magnetic cluster for theatre sound reproduction recently developed by the Theatre and Sound Products Dept. of RCA. An economy measure, the new



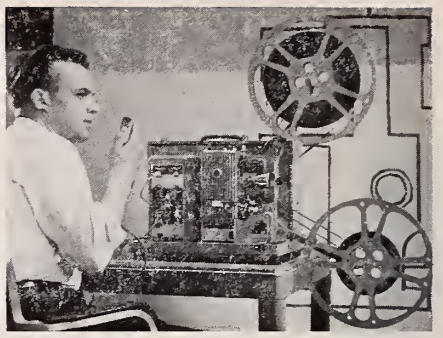
RCA's replaceable cap for magnetic soundhead clusters is shown at right compared with the complete cluster at left.

device makes it unnecessary to discard a complete cluster when its pickup heads are worn out. Instead, a replaceable cap with new pickup heads can be inserted in the original cluster at only a small part of the cost of replacing the complete cluster.

It was announced that the new RCA magnetic cluster with replaceable cap can be used with any type of RCA magnetic soundhead, for reproduction of either one or four magnetic sound tracks. The replaceable cap feature has been incorporated, at no increase in price, in all RCA magnetic clusters and complete magnetic soundheads now being shipped.

A PROJECTOR THAT RECORDS SOUND on magnetically striped 16-mm film and then projects both sound and picture has been introduced by Eastman Kodak. Referred to as the Kodascope Pageant magnetic-optical projector, the $795 combination unit has an extremely low level of projection noise to minimize interference during sound recording.

In addition to providing sound from single-perforated film with full-width or half-width magnetic striping and from double-perforated film with quarter-width striping, the projector is capable of



Kodak's new magnetic-optical 16-mm projector.

adding a magnetic track to a sound film having a conventional optical track. Magnetic striping may be added for approximately 2½ cents per foot of film.

The projector comes with a microphone that permits pre-setting of the proper recording volume. A flashing light indicates the correct recording level at all times. Mistakes are corrected by simply reversing the film and re-recording. A special lock prevents accidental erasing of the sound track, while an additional safeguard is provided by a red light which goes on automatically when the projector is erasing and recording.

The machine is so designed that a record player, tape recorder, or other sound source can be plugged in for direct recording. Background music and



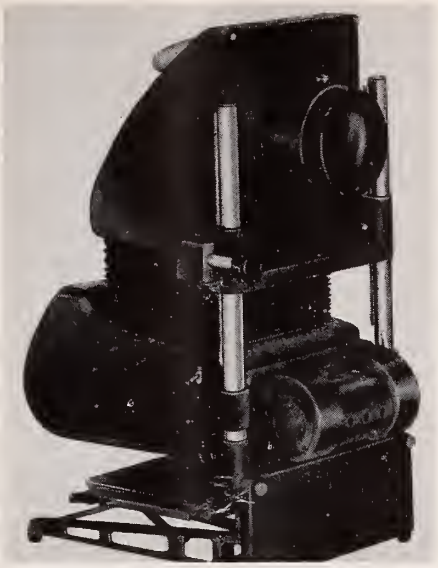
narration can be recorded at the same time or separately. Simultaneous recording is made possible by independent volume controls with adjustable "stops" which can be pre-set for the minimum and maximum volume desired. The controls are part of a built-in "mixer" system which permits recording of both the music and narration at appropriate levels. It is also possible to record the music first, at normal volume, and then add the narration later with controls set at "magnetic overlap" to automatically reduce the music to background level.

Another interesting feature of the new Kodascope projector is the collapsible reel arms attached to the projector which can be folded for storage without removing the belts. An 8-inch speaker in a lift-off baffle cover is said to provide superior sound quality.

FASTER 16-MM REWIND. A more efficient inspection-rewind machine has been announced by the International Film Bureau, Inc. of Chicago for use by 16-mm libraries and distributors. An outstanding feature of the machine, known as the Foster Rewind, is a foot pedal which controls the speed as well as the forward and reverse movements of the reels. Both reels operate synchronously, stopping instantly upon a break in the film or the release of pressure on the foot pedal. At any speed, it is claimed, operators with a minimum of training can easily detect film damages, perform the necessary splices, and then continue rewinding faster than heretofore possible.

A TRIPLE PURPOSE PROJECTOR for instructional use has been unveiled by Projection Optics Co., Rochester, N. Y. Known as the Transpaque, it is said to be the first projector to utilize a single projection head for opaque, transparency, and table projection. The Transpaque will project opaque or transparent materials up to 11 inches square, including square 11-inch segments of larger material.

The Transpaque projector can be had



The "Transpaque," a triple-purpose transparency projector from Projection Optics.

with a complete selection of lenses in focal length from 4 inches to 40 inches, enabling the projectionist to obtain the proper sized image at any distance for any screen. In addition, the new unit may be purchased for either opaque, transparency, or table projection only, the other components to be added later as needed. Change from one type of projection to any other can be effected quickly and easily.

A LENS CONVERTER for 16-mm Kodascope projectors which incorporates lenses of two focal lengths in one accessory has been put on the market by Eastman Kodak Co. for $26.50. The snap-on Cine-Kodak bifocal converter is designed for use with the Kodak Royal, Pageant, and Analyst projectors with the standard 2-inch, *f*/1.6 Ektanon lens.

The focal length of the converter is altered simply by reversing its position. Focal length of the standard 2-inch lens can be changed to 2½ inches or 1⅝ inches, as desired. This enables the projectionist to overcome certain limitations on the size of the screen image that may arise due to the location of the projector. For example, with a projection distance of 25 feet the standard 2-inch lens will fill a screen approximately 5 feet wide; but with the use of the converter, the image may be reduced to 4 feet or increased to 6 feet, depending on the size screen available, without having to move the projector.

BOOK REVIEWS

KNOW YOUR CAMERA, by Alfred Wagg. Wilfred Funk, Inc., 244 *pages*, $3.95.

Alfred Wagg is a man who knows as much about lenses, film, shutters, and cameras as anyone around. He also knows his photography (still), as the more than 250 illustrations in this book can attest. More important for the reader, he can write about cameras and photography in a clear easy authentic style, readily comprehensible to amateur and professional alike. Wagg places due emphasis on the importance of proper equipment in picture-taking, but his main premise is that the equipment be-

Fabulous New Film Cement

It was announced that a revolutionary new type of film cement for all 16- and 35-mm film has been developed by a leading laboratory. The ability of this cement to prevent splices from pulling apart and peeling far surpasses anything previously tested. A limited amount has been released for consumer use exclusively to

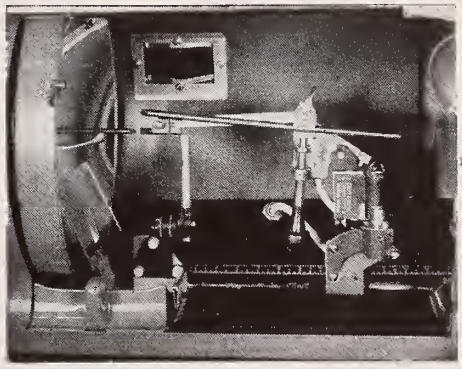
FLORMAN & BABB
Movie Equipment Distributor
68 West 45 St., New York, N. Y.
Prices quoted for F&B cement: 1 oz., 40c; ½ pt., $1.50; pt., $2.50. Free sample of F&B #55 sent on request

WANT TO START A MINT?

If you have Ashcraft "D" or "E", Brenkert-Enarc, Peerless Magnarc, or Strong Mogul projection lamps you can save an average of $400.00 annually by investing only $42.50 in a

CRON-O-MATIC
Fully Automatic
CARBON SAVER

Uses positive carbon stubs of any length, without preparation. When entirely consumed, the new carbon goes into use without affecting the lamp operation in any way. Burning average lengths (3¼") down to ¾", saves 22.2% on your carbon costs. If your dealer can't supply you, order direct.



PAYNE PRODUCTS CO. *(Cron-O-Matic Division)*
2454 W. Stadium Blvd., Ann Arbor, Michigan
( ) Send literature on the Cron-O-Matic.
Ship Cron-O-Matic ( ) C.O.D. inc. postage.
( ) Remittance herewith.

Name .....
Theatre .....
Street .....
City & State .....

Export: Frazar & Hansen, Ltd.
San Francisco, New York, Los Angeles

hind the camera—the human being taking the picture—is the prime factor. In addition to concrete recommendations for taking good pictures, scattered throughout the book are many interesting little-known facts about photography.

ELECTRONIC MOTION PICTURES, by Albert Abramson, University of California Press, 212 *pages*, $5.

Abramson begins his book boldly: "The cinema has entered the electronic age. The electronic motion picture is a reality. Motion picture production is changing from a mechanical process to an electrical one. The film camera is being replaced by the electronic television camera. Motion picture film is being superseded by magnetic tape. Even the motion picture projector is giving way to the large-screen electronic reproducer."

The author then goes on to give us a survey of the history of the film camera and sound recording, tracing at the same time the development of commercial and large-screen TV in the U. S. and England. He discusses current research being carried out in the area of the electronic camera, with special emphasis on the new means of picture and sound recording and playback on magnetic tape. In no uncertain terms, he leaves us with the impression that electronic movies will work wonders for the industry, and that as soon as some of the mechanical kinks are straightened out they will be made by Hollywood on a large scale for theatrical exhibition. Maybe, but we doubt it.

Electronic Motion Pictures is a very readable book about a new branch of the theatre industry. However, Abramson's enthusiasm to the contrary, it is more than likely that many years will pass by before electronic movies come into widespread use.

OBITUARIES

SIMONSON, H. F., 53, member of Local 482, Champaign, Ill. and prominent attorney in that city, died June 3. He had been in failing health since he underwent surgery several months ago. A native of Chicago, Simonson worked his way through the University of Illinois by working as a projectionist. He became a member of the Champaign Local in 1923 and served as business representative for several years, helping the Local over many of its "rough spots." In recognition of his services, Local 482 awarded him last November with a gold life membership card (see IP for January, 1956, p. 21). His widow and two children survive.

• • •

STEWART, DANIEL M., 55, member of Local 191, Cedar Rapids, Iowa, and projectionist at the Paramount Theatre in that city, died June 5 following a long illness. A member of the Local for 30 years, he served as business representative and financial secretary for the past 20 years; and at the time of his death was also president of the Iowa State Association of the IATSE. He was a member of Mt. Hermon Lodge No. 263, AF & AM; Iowa Consistory; El Kahir Shrine; Cedar Chapter No. 183, OES; Gethsemane White Shrine, and the Moose Lodge. He is survived by his widow and four children.

• • •

MADGER, JOHN A., 66, member of Cleveland Local 160 since 1920, died after a brief illness.

LETTERS TO THE EDITOR

(*Continued from page* 21)

hours spent with other young friends in that little "theatre." I projected endless loops of film and glass slides and also bought odd lengths of professional film from a second-hand shop, which used to get a few reels from somewhere.

I remember the machine was made in Germany and was probably classed as an expensive toy, as most things of that nature came to England from Germany before World War I. I believe the lamphouse had a gun metal finish with the mechanism frame painted red. The whole machine was very sturdy. The lens was a light brass tube telescope type which slid in and out for focusing.

I'm sorry I have no clue to the maker's name, but perhaps a camera shop dealing in traded-in equipment might come up with a lens similar to the original which could be fitted into the machine to make it usable. I would very much enjoy hearing that the owner succeeded in getting it to operate.

C. F. ORMOND

San Anselmo, Calif.

Teenage Dances in Theatres

To the Editor of IP:

The idea behind this letter is to suggest a means of getting more people to attend our motion picture theatres—especially the teenagers. The teenagers of our land are constantly shopping around for entertainment that they will like and that will give them a sense of participation. They all have "the love of music" and a desire to express that feeling in action, which is dancing. Well, why not arrange for them to dance right in the motion picture theatre? If the high sales of phonograph records and the current rock 'n roll craze are any sort of gauges, then the kids will come flocking to their neighborhood thea-

HUFF'S PACKAGE COOLING SYSTEM

Consisting of

(1) The Positive Carbon Cooler, (2) The Film Track Cooler, and (3) The Automatic Film Humidifier

will give you an advantage of from 10 to 25 per cent more screen light than is now available from your 16- or 18-inch mirror lamps used with Brenkert or X-L heads, plus a saving of 50 per cent lamp maintenance cost.

See your dealer or write direct to

HAL I. HUFF MFG. CO. • **3774 SELBY AVENUE LOS ANGELES 34, CALIF.**

Clayton Ball-Bearing Even Tension Take-Ups

For all Projectors and Sound Equipments

ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS. SILENT CHAIN DRIVE

THE CLAYTON REWINDER

FOR PERFECT REWINDING ON 2000-FOOT REELS.

CLAYTON PRODUCTS CO.

31-45 Tibbett Avenue **New York 63, N. Y.**

tres—to watch the picture or pictures, and then dance.

As a projectionist I know that the modern techniques in picture presentation have created idle space in many theatres, which can easily be converted into suitable dancing areas. I visited quite a few movie houses and found ten or twelve rows of seats nearest the screens empty. The reason is simple—it is impossible to sit near a wide screen and enjoy the picture. So why not rip out those unnecessary seats and build a smooth sunken dance floor with a little railing around it? Lights could be installed on the railing which would throw a soft illumination into the dance pit, while baby spots could be anchored on opposite walls for the same purpose to be controlled from the projection room.

The dancing interlude, a period of about twenty minutes, could be accompanied by a short showing a popular band playing music with professional dancers performing on the screen, while the teenagers and others shuffle around in the pit. Call it "The Intermission Club," as it will be held between features or between shows. Proper community promotion would not only attract the youngsters but the older spectators as well, and all would have a good time.

JAMES W. MORRISON

New York, N. Y.

Correction

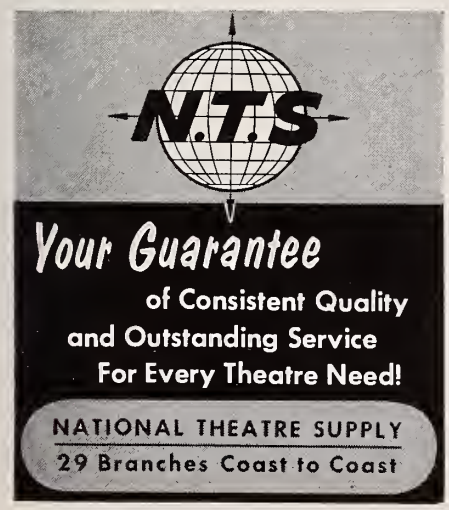
To the Editor of IP:

It was a matter of gratification to note publication in the June issue of IP of the first portion of my paper on military theatres in the Far East, originally presented at the 78th semiannual convention of the SMPTE.

The article contained, however, a typographical error that must have proved confusing to many readers. In our FEAAFMPS practice, utilization of simplified high-intensity lamp sources operating at 70 amperes current is confined to an inclusive screen-width range of 30 to 35 feet, and not from 30 to 50 feet as the text indicated.

ROBERT A. HAINES

Far East Army and Air Force
Motion Picture Service



COLORS IN "MOBY DICK"

(*Continued from page* 15)

homa" or "Carousel" would certainly not have worked here even half as well as the subdued tones that were used.

Once the new color printing method was decided upon, it meant accompanying changes in the photographic technique. About the photography, Morris had this to say—"Filming at sea itself presents a problem of color control, but filming also with a completely revolutionary color technique made my job even more difficult. We found that to obtain the most exciting effects we had to work in the most turbulent seas, even on platforms lashed to row boats." Four hundred million feet of film was photographed and edited down to 11,000 feet for the current 1 hour 56 minute performance.

Morris went on to say "that the most accurate way to describe our new color technique is to compare it to old photographs in a family album. The pages trace back through the family's past and the pictures become more and more faded until the tones seem to have blended and added a feeling of color and atmosphere not normally found in black and white or even richly-colored prints."

Photographic Problems

The color used in "Moby Dick" is not natural color. Natural colors as perceived by the eye were intentionally distorted in this film. The sun is never so bright nor the sea and sky so blue in the picture as they are in real life. Yet strangely enough, the total impact is that they are more deeply experienced by the spectator than if they had their true life colors. There are some very exceptional sequences during which emotionally, if nothing else, the audience is dragged along in a small boat by a whale with a feeling of participation comparable to the physical sensations of a Cinerama roller-coaster ride.

For all this, the new process may have one flaw which doubtlessly will be overcome in the future. This has to do with lighting and may very well be related to the photography. The darker shots aboard the whaling ship *Pequod* lose some of their effectiveness because at times they appear too dark. In all likelihood, Morris and Huston intended these sequences to appear the way they did, with a bare miniumum of light, for the sake of atmosphere. Nevertheless, one found oneself leaning forward slightly at these times to see more clearly what was going on on the screen.

Projectionists Approve

Projectionists at the first-run Criterion Theatre in New York, David Senzer and Henry Basist, members of Local 306, reported no problems whatsoever with the six reels of color film that make up "Moby Dick." Aside from those brief scenes apparently intended to be dark, they said the lighting throughout was good. At 180 amperes, the same amount used for other films at the big Criterion theatre, the Peerless high intensity condenser arc lamps supplied all the illumination necessary for good projection.

Technicolor Alters Name

Effective this month the name of Technicolor Motion Picture Corp. has been changed to Technicolor Corp. It was stated that the step was geared to the advancement of Technicolor into a broader area of service within the color field. Recent reorganization has established three independently functioning but wholly-owned and operated divisions of the new Technicolor Corp.—motion pictures, amateur color processing, and graphic arts.

SPLICES NOT HOLDING ?

Film breaks are costly.
Play safe by using

JEFRONA

All-purpose CEMENT

Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.

CAMERA EQUIPMENT CO.
DEPT. J-8-8
315 West 43rd Street New York 36, N. Y.
JUdson 6-1420

MAGNETIC TRACKS

(*Continued from page 9*)

must be rewound very slowly and evenly to minimize the bad effects of reel magnetization. Furthermore, the rewinder motor, if closer to the reels than 1½ or 2 feet, should be magnetically shielded by an enclosure of sheet iron.

Although magnetic interference generated by rewinder motors is a common source of damage to magnetic tracks, hand rewinding is out of the question in one-man projection rooms. The complications of present-day projection require two men per shift for the most efficient management of the projection process.

Rewinder tables having iron or steel tops should be covered with Masonite or similar fiberboard material when repairing magnetic-track prints in order to avoid contact of the tracks with magnetizable metal. Magnetized table tops are capable of weakening the recorded sound signals and distorting the sound by deforming the shape of the magnetic waves.

Splicing Magnetic Film

Splicers for CinemaScope magnetic-track film should be constructed entirely of non-magnetizable metal to avoid sound erasure and noise pickup. Since the registration pins are smaller than those for regular film, most projectionists use two splicing blocks, one for regular and the other for CinemaScope magnetic film. Splicers for magnetic film should have non-magnetic shear blades and pressure bars, as those made of steel usually result in noisy splices.

The actual splicing of magnetic-track film is troublesome because the magnetic striping must be scraped from the back of the butt stub. If this is not done, the film cement will dissolve the magnetic striping material, causing it to ooze from the splice area. Not only will the picture area be smeared by the brownish material, but a loud thump, or "plop," may be heard in the sound when the splice passes over the penthouse pickup magnets.

Perfectly silent magnetic-track splices are hard to make in CinemaScope prints. Sound splices cut at an angle are less noisy, but unfortunately cannot be used in picture prints. Magnetic "blooping" of the splices is effective, but is very hazardous to the tracks unless accomplished by apparatus specifically designed for the job. Don't try to bloop CinemaScope splices with the projector degausser: hundreds of feet of magnetic track may be erased!

Cleaning of Film

What about cleaning CinemaScope magnetic-track prints? We don't advise extensive film cleaning in the projection room. It's a messy job when hundreds or thousands of feet of film have to be cleaned, and the most effectie cleaning fluids are dangerous. Unless regular film-washing machines are used, the film may become badly spotted by imperfectly removed oil and dirt. Only short trailer and announcement titles should be cleaned by hand, and then only with strict observance of safety rules.

Apply carbon tetrachloride, lead-free gasoline (lighter fluid or cleaning naphtha), or the commercial carbon tet and naphtha mixture known as "Carbona" to a pad of soft, clean cotton cloth. Draw the film through the fluid-dampened pad, refolding the pad as it gets dirty, and making certain that the cleaning fluid has completely evaporated from the film before winding it into the roll.

Clean film in a well-ventilated place only. Keep in mind the fact that gasoline vapor is dangerously explosive, and that carbon tetrachloride fumes are treachorously poisonous. Neither of these cleaning fluids will harm magnetic tracks, although gasoline has a tendency to make the film curly.

Just one more word of warning anent carbon tetrachloride. Poisoning may result from absorption of this liquid through the skin or, more especially, from inhalation of the fumes. Carbon tet poisoning may end fatally hours or even days after exposure. *Don't use carbon tet for cleaning film unless adequate ventilation is provided!*

[TO BE CONCLUDED]

Cause of Theatre Fires

Exits that were not properly marked and lighted plus a lack of sufficient exits have been the principal factors in the large loss-of-life fires that have occurred in theatres throughout the world in the past century. This and other findings are contained in a special illustrated study of 100 motion picture theatre fires, Fire Record Bulletin FR 56-1, recently published by the National Fire Protection Association.

The 16-page bulletin cites specific case summaries of fires in both indoor motion picture theatres and drive-in theatres from 1949 through 1955. Typical loss-of-life theatre fires dating back as far as 1808 are listed. Copies of this special occupancy fire record may be obtained from the NFPA Publication Department, 60 Batterymarch St., Boston. Price is 50 cents per copy.

Q: When is a mistake a blunder?

A: When a projectionist is not a regular subscriber to IP—a MUST reading for the projectionist craft.

Use the handy order form below

INTERNATIONAL PROJECTIONIST
19 West 44 St., New York 36, N. Y.

Enter my subscription for ☐ 1 year (12) issues—$2.50
☐ 2 years (24) issues—$4.00

Foreign and Canada: Add 50c per year

Name .....

Address .....

City ..... *Zone* ..... *State* .....

The terrible vengeance of Joseph P. Fyffe



ON A WARM August evening in 1870, a footsore stranger in naval officer's uniform walked into East Haddam, Conn.

His name was Joseph P. Fyffe, and he was revenging himself on the Navy for refusing to advance him travel money to proceed to his new station, San Francisco.

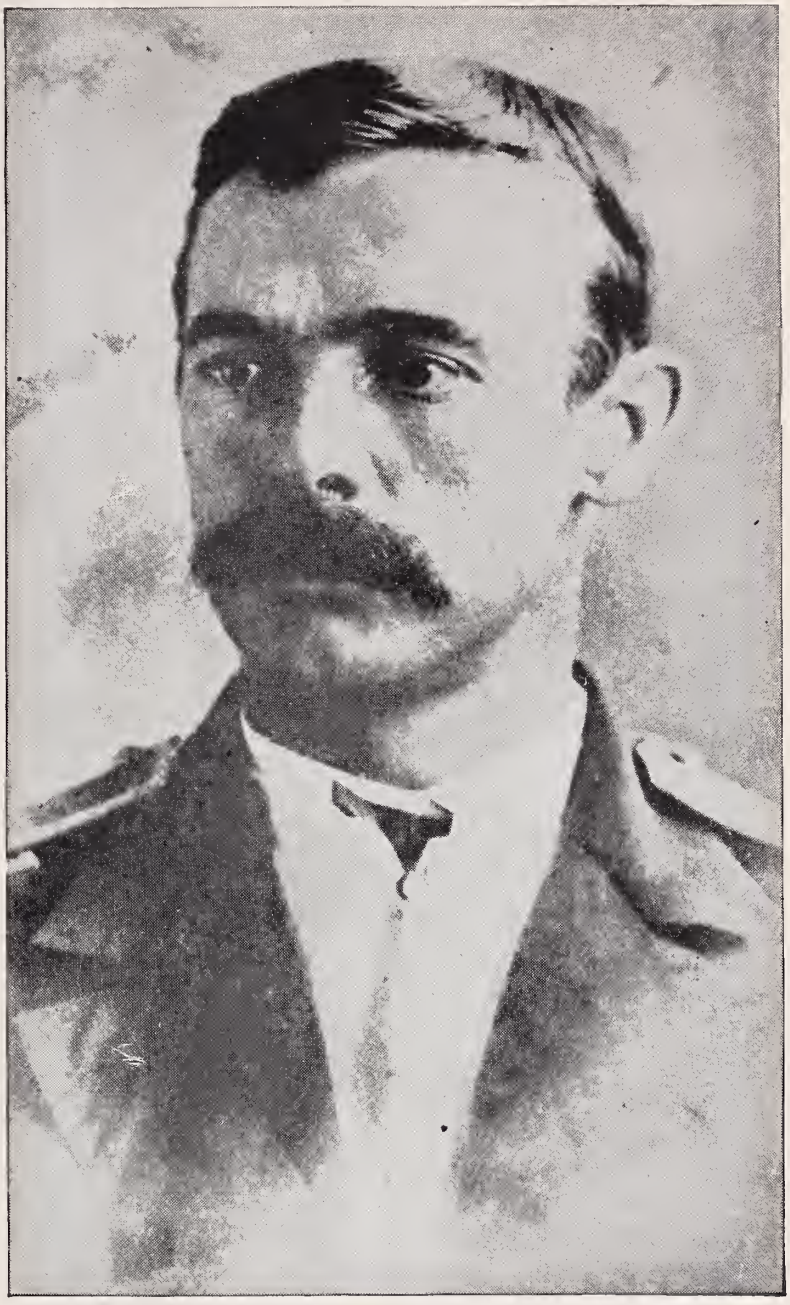
He was trudging cross-country *on foot.* And conscientiously wiring in daily progress reports well-calculated to give his superiors apoplexy. His sixth, from Albany, N.Y., read in part:

> *"Entered Albany barefooted X Comfortable X Earning my keep as bartender X Local rum far superior that served in Navy X Am sending sample"*

At this, the Navy struck its colors, reversed its time-honored tradition, and began prepaying travel allowances.

Strangely enough, Joe Fyffe actually wound up as a rear admiral. That, of course, was years later; and he has long since passed to his reward. But his vigorous and outspoken independence is still alive and kicking in today's Americans. That's why our country is a strong, vital nation and why our country's Savings Bonds are one of the finest investments in the world.

165 million Americans stand behind U.S. Savings Bonds. *There is no better guarantee.* So buy Bonds regularly—and keep the ones you buy.



★ ★ ★

It's actually easy to save—when you buy Series E Savings Bonds through the Payroll Savings Plan. Once you've signed up at your pay office, your saving is done *for you.* The Bonds you receive pay good interest—3% a year, compounded half-yearly when held to maturity. And the longer you hold them, the better your return. Even after maturity, they go on earning 10 years more. So hold on to your Bonds! Join Payroll Savings today—or buy Bonds where you bank.

Safe as America – U.S. Savings Bonds

PUBLIC SERVICE ADVERTISING COUNCIL

The U.S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

PERFECT SYNCHRONIZATION...

One reason why Simplex equipment outperforms all others is the *perfect* synchronization of all parts. This is no accident! From the drawing board stage right through to finished part . . . at Simplex only *exactness* is accepted. And when these parts are assembled, they fit with a precision unparalleled in the industry! It is this superior quality control at the manufacturing level that creates perfect performance at the projection level. Little wonder, therefore, why theatres everywhere, large and small, overwhelmingly prefer



Simplex
T.M. REG. U.S PAT. OFF.

PROJECTION and SOUND SYSTEMS

MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION • DISTRIBUTED BY NATIONAL THEATRE SUPPLY
SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

GPE

SEP 1956 B 613137

PROJECTIONIST

INTERNATIONAL

OCT 1956



SEPTEMBER 1956

VOLUME 31 • NUMBER 9

30c A COPY • $2.50 A YEAR

No lamp in the World!

CAN PRODUCE SO MUCH LIGHT.

Peerless HY-CANDESCENT TRADE MARK REG.

CINEARC

NOT A REFLECTOR ARC!

WRITE FOR DATA

Peerless MAGNARC TRADE MARK REG.

CINEARC

A 75-77 AMP. REFLECTOR ARC!

22,000 TOTAL LUMENS ON SCREEN

NO-HIGH-RATE

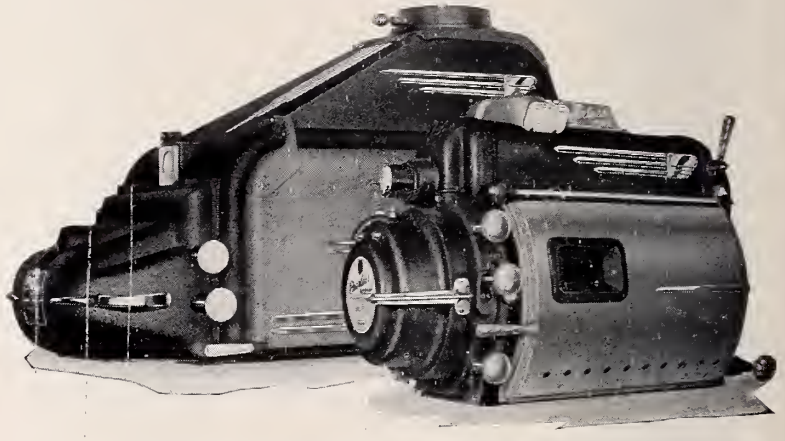
——— PROOF ———

Hy-Candescents were selected for all **important** "CINERAMA" installations. (Chicago, New York, Los Angeles, San Francisco, Philadelphia, and Washington, D. C.)

Hy-Candescents were chosen by Paramount for **all** installations of Horizontal "VISTA-VISION".

Hy-Candescents were again selected by TODD-AO for "OKLAHOMA".

You have to do the same if you want all the light there is for big pictures.



At 75-77 amperes . . . With presently available and standard 8 x 9 m/m copper coated carbons . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . With a 14" diameter No. 2012 PEERLESS "Hy-Lumen" glass reflector that retails at a list price of $22.00 F.O.B. Chicago . . . With a No. 2880 PEERLESS Tail Flame Flue . . . On any kind or any size screen . . . No Heat Filter required.

All of this, at the **lowest** possible first, and operational **cost**. And ———————

OF ($60.00) REFLECTOR BREAKAGE AND SILVERING DETERIORATION OR HEAT FILTER UPKEEP !

J.E. McAULEY MFG. CO.

552-554 WEST ADAMS STREET

CHICAGO 6, ILLINOIS

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

SEP 27 1956

B 613137

You Pay for the Light —BE SURE YOU GET ALL OF IT!

When you reduce the size of the spot of the ordinary spotlight you must mask out, or iris down, part of the light beam, thus wasting much of the available light.

BUT —when you have a spotlight with a two element variable focal length objective lens system, an exclusive feature of Strong spotlights—the brilliance of the spot actually increases as it is reduced in size. Both lenses are simultaneously controlled by one operation.



Strong TROUPERETTE INCANDESCENT SPOTLIGHT

Sparkling, flickerless light aplenty for your show, concert, play, dances and special events. A sharp edged spot from head to flood. Fast-operating, 6-slide color boomerang. Horizontal masking control angles 45° in either direction. Mounted on casters for easy portability. Plugs into any 110-volt outlet.

There's nothing to compare with a Strong spotlight, say all those who own one or have seen one.



Strong FULLY AUTOMATIC ARC SPOTLIGHTS

For projecting a powerful, snow-white light in large auditoriums.



THE TROUPER

Adjustable self-regulating transformer in base.



SUPER-TROUPER

Direct current high intensity with built-in power conversion unit.

Among the dealers who have Trouperettes and will gladly arrange a demonstration are:

ALABAMA — Montgomery Photo Sound, Inc., 166 Church St.
CALIFORNIA — Berkeley Stagecraft Studios, 1854 Alcatraz Ave.
Fresno: Midstate Theotre Supply, 1906 Thomas
Los Angeles: C. J. Holzmueller, 2533 S. Hill St., Pembrex Theotre Supply, 1969 S. Vermont Ave.
B. A. Shearer Co. 1964 S. Vermont Ave.
Redwood City: Associated Lighting Service, P.O. Box 1033
San Francisco: C. J. Holzmueller, 1108 Howard St.
W. G. Preddey Theatre Supplies, 187 Golden Gote Ave.
Western Theatrical Equipment Co., 337 Golden Gate Ave.
CONNECTICUT—Hartford 1, Harrison Horries, 110 High St.
ILLINOIS—Chicago, Gardner Theatre Service Inc. 1314 W. Wabash Ave.
Grand Stage Lighting Co., 23 West Hubbard St.
National Theotre Supply, 1325 South Wabash Ave.
INDIANA — Indianapolis, Ger-Bar Inc., 442 North Illinois St.
Union City: Projection Equipment Co., 40B Plum St.
KANSAS—Topeko, Fred M. Walls, Theatre Service Co. Inc., 827 Wayne St.
KENTUCKY—Louisville 2, Folls City Theatre, Equipment Co., 427 So. Third St.
LOUISIANA—New Orleans, W. H. Bower, Spangenberg, Inc., 1010 Central Ave.
MASSACHUSETTS — Boston 16, Major Theotre Equipment Corp., 44 Winchester St.
MICHIGAN — Detroit, Albert F. Runnel Studios, 4767 14th St.
MINNESOTA—Duluth 2, Nationol Equipment Co., 7 East Michigan
Minneapolis 3, National Theatre Supply, 56 Glenwood Ave.
MISSISSIPPI — Jackson, Jackson Theatre Supply Co., 414 West Capitol St.
MISSOURI — Kansas City, Greot Western Stage Equip. Co., Inc., 1324 Grand Ave.
MONTANA — Great Falls, Northern School Supply
NEBRASKA—Omoha Quality Theatre Supply Co., 1515 Davenport St.
NEVADA — Las Vegas, Stoge Sound and Equipment Co., 1500 S. Moin St.
NEW YORK—Albony, Albany Theatre Supply Co., 443 North Pearl St.
Buffalo 2: National Theatre Supply, 500 Pearl St.
New York City: Amusement Supply Co., Inc., 346 W. 44th St.
Camera Equipment Co., 1600 Broodway National Theatre Supply, 356 W. 44th St.
Norpat Sales, Inc., 113 West 42nd St.
Syracuse: J. R. Clancy, Inc., 1000 West Belden Ave.
NORTH CAROLINA—Charlotte, Standard Theotre Supply Co., 219 S. Church St.
GREENSBORO: Stage Decoration & Supplies, 620 Joyner St.
Standard Theatre Supply, 215 E. Washington St.
NORTH DAKOTA — Forgo, Northern School Supply
OHIO—Akron 13, Charles Hermann, Electrical Sales, 206 S. Hawkins St.
Columbus 15: Schell Scenic Studio, 581 S. High St.
OKLAHOMA — Oklahoma City 2, National Theatre Supply, 700 West Grand Ave.
OREGON — Portland 9, Northern School Supply, 1505 N.W. Lovejoy
PENNSYLVANIA — Harrisburg, J. P. Lilley & Son, 928 N. Third St.
Philadelphia 7: National Theatre Supply, 1225 Vine St.
Pittsburgh 22: Appel Visual Service, 927 Penn Ave.
Reading: Hollywood Film Service, 841 Penn St.
TENNESSEE—Memphis National Theatre Supply, 412-414 South 2nd St.
TEXAS—Dallas, Harry Little, 10501-03 Hines Blvd. National Theotre Supply, 300 South Harwood St.
WASHINGTON — Seattle Display Lighting, 2110 Western Ave.
Northern School Supply, 2603 First Ave.
Spokane: Northern School Supply
WEST VIRGINIA—Huntington Theatre Service & Supply Co., 1019 10th St.
CANADA
ALBERTA—Colgary Sharp's Theatre Supplies Ltd., Film Exchange Bldg.
MANITOBA — Winnipeg General Theatre Supply Co. Ltd., 271 Edmonton Street
ONTARIO—Toronto General Theatre Supply Co. Ltd. 861 Bay St.
QUEBEC—Montreal Perkins Electric Co. Ltd., 1197 Phillips PL.
Quebec: La Cie Martineau E'lectrique Limited, 860 Est Rue Du Roi

THE STRONG ELECTRIC CORPORATION

31 CITY PARK AVENUE • TOLEDO 2, OHIO

Please send free brochures and prices on Strong ☐ Trouper; ☐ Trouperette; ☐ Super-Trouper. ☐ Please arrange a demonstration on the Trouperette.

NAME _____

SCHOOL _____ **THEATRE** _____

STREET _____

CITY & STATE _____

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

THE TRULY AMAZING

ASHCRAFT SUPER CINEX

LIGHT PROJECTING SYSTEM

140-165 AMPERES • 40% MORE LIGHT THAN EVER BEFORE

NEW

13.6 MM CARBON ARC

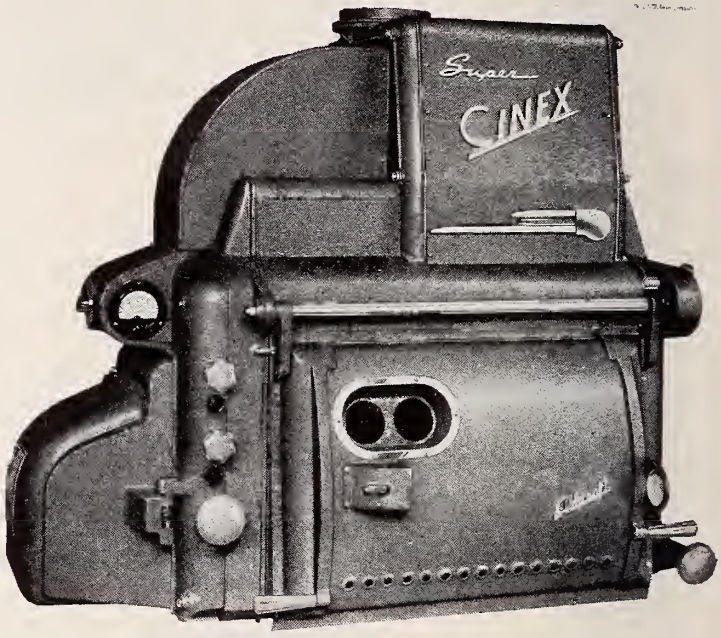
HIGHER POWER!
LOWER COST!

F 1.6

FASTER SPEED OPTICS!

•

CONTROLLED FILM HEAT!



NOW! YOUR DRIVE-IN CAN HAVE THE BRILLIANT LIGHT OF INDOOR THEATRES

PROGRESS and LEADERSHIP!

THIRTY SEVEN YEARS of continuous progress and initiative in the field of motion picture light projection have placed the *C. S. ASHCRAFT MFG. CO.* first and foremost as the leader in the development and manufacture of new and better methods of projecting ever increasing screen illumination.

NOW AGAIN in 1956 we have created a new—highly developed and *COMPLETE LIGHT PROJECTING SYSTEM*—THE SUPER CINEX—capable of increasing our projection lamp output up to approximately 50,000 lumens. This represents a light increase of more than 40% above our present maximum, using standard, inexpensive, slow burning carbons. The power required is surprisingly low.

PROJECTION TO PLEASE YOUR PATRONS!

YOUR PATRONS are entitled to the best possible projection. Your picture should be clearly visible from every section of your Drive-In. Heretofore, limited illumination combined with dense prints have made good projection difficult.

THE SUPER CINEX system of Projection Lamps and Multiphase Rectifiers combined with good projectors and good lenses will project an amazingly good picture on the largest screens.

SEE SUPER CINEX TESMA–TOA TRADE SHOW • BOOTHS 78 and 79
SEPT. 20-24 at the COLISEUM, NEW YORK CITY

U. S. Distribution through INDEPENDENT THEATRE SUPPLY DEALERS • Foreign: WESTREX CORPORATION Canada: DOMINION SOUND EQUIPMENTS, LTD.

C. S. ASHCRAFT MANUFACTURING CO., INC.

36-32 THIRTY-EIGHTH STREET, LONG ISLAND CITY 1, NEW YORK

International PROJECTIONIST

R. A. ENTRACHT, *Publisher*
JAMES MORRIS, *Editor*
R. A. MITCHELL, *Contributing Editor*

Volume 31 SEPTEMBER 1956 Number 9

Index and Monthly Chat 5

Development of the Super Cinex Lamp 7
CLARENCE ASHCRAFT

Thrillerama Show Opens in Houston, Texas 9

Magnetic Tracks on Release Prints, II 10
ROBERT A. MITCHELL

What Causes Poor Projection? 14
JAMES MORRIS

Speaker Control for Drive-ins 15

IATSE Convention Keynote Is Unity on Industry Problems 16

Merle Chamberlin's Talk to IATSE on Current Projection Problems 17

In the Spotlight 19

Technician's Viewpoint 21

16-mm Field Awaits Xenon, Cronar 22

IA Election 24

Obituaries 25

Ray Brian's Movieana Archives 26

SMPTE to Stress Theatre Projection 28

Miscellaneous Items, New Notes, Technical hints

INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co., Inc., 19 West 44 Street, New York 36, R. A. Entracht, President. Telephone: MUrray Hill 2-2948. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States and U. S. Possessions, $2.50 per year (12 issues) and $4.00 for two years (24 issues). Canada and Foreign countries: $3.00 per year and $5.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Entered as second-class matter February 8, 1932, at the Post Office at New York, N. Y., under the act of March 3, 1879. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles.

Entire contents copyrighted 1956 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

420

Monthly Chat

Management Cooperation

WE WOULD LIKE to call attention this month to some information gathered by *Showmen*, house organ published by the large National Theatres circuit. The question, "Should projectionists be made to feel welcome to attend theatre staff meetings if they so desire?" was posed to National managers, and replies thereto were printed in the house organ. These replies showed that managers are beginning to recognize the enormously more important and more complex job that projectionists now perform. Some reported that projectionists already attended regular staff meetings; all declared that they were heartily in favor of inviting projectionists to attend more frequently.

Even in the old days, when the operation of projection equipment was comparatively simple and a large part of the projectionist's job was unceasing vigilance against the ever-present threat of a disastrous nitrate-film fire, there was far too little cooperation on technical problems between management and the projectionist. Now the situation has changed, and such cooperation is essential if a theatre is to have the best possible picture and sound.

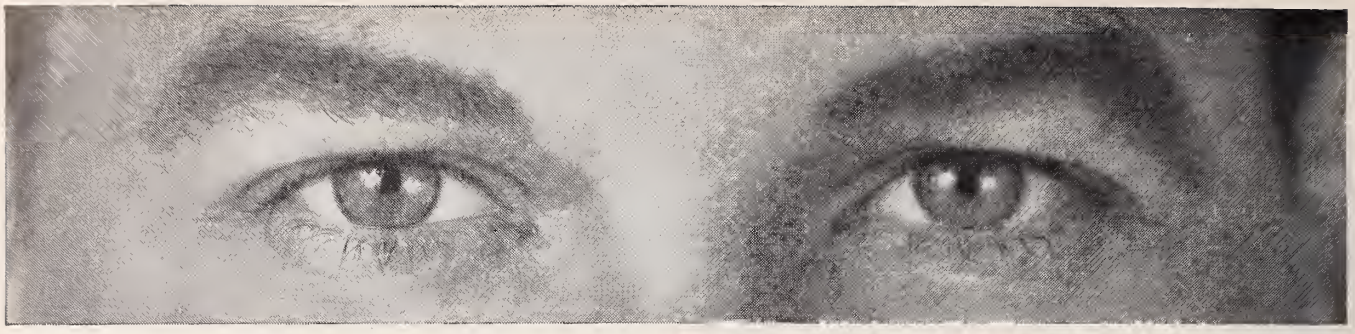
As an example, take the current complaints from moviegoers about poor or excessively cropped screen images, and about weird changes in the shape of the picture when a switch is made from anamorphic to non-squeezed prints. Many of these complaints might never have occurred if projectionists were able to explain the limitations forced upon them by their present equipment and the physical dimensions of their theatres.

A more complete understanding of projection problems by management might have resulted in the purchase of necessary new lenses or other equipment, or the working out of a compromise whereby both anamorphic and "flat" pictures would have been reasonably large without differing strangely from each other. Projectionists who are dissatisfied with the size and shape of their screen images would do well to reread Robert A. Mitchell's article, "A Common-Sense Approach to Screens, Apertures and Aspect Ratios," which appeared in the June and July issues.

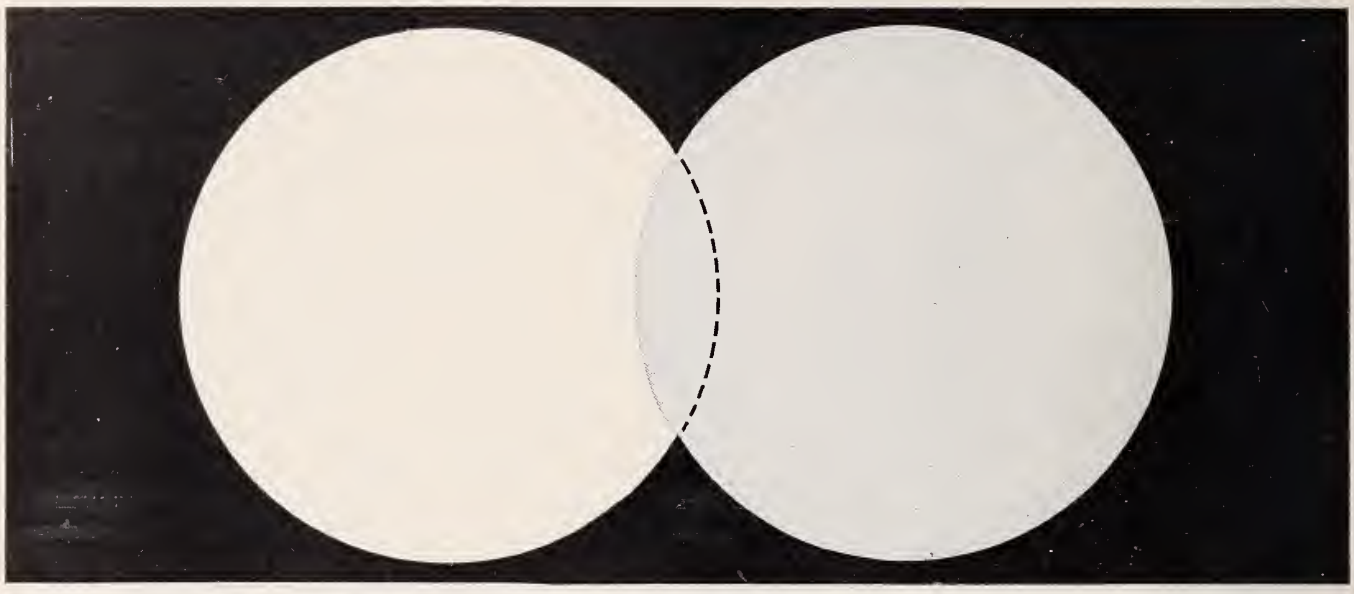
Government Aid

THERE ARE GOOD omens for the future prosperity of theatre exhibition in the current attitude of the Federal Government toward the industry. Congress passed and the President has signed a bill which eliminates the tax on admissions costing up to 90 cents. The relief provided by this bill will make the difference between chronic losses and a modest profit for many theatres.

Of equal importance may be the decision of the Small Business Administration to consider the idea of making theatre owners eligible for Federal loans to replace worn-out equipment and generally improve their facilities. At present, funds to finance recreation or amusement facilities are denied by the SBA. This concern on the part of the Government indicates that there is a growing realization, now that many theatres have been forced to close, of the important service theatres perform, both to the public and to the small main-street businessmen with enterprises clustering around the local theatre.



You can see the difference...



WITH THE NEW NATIONAL TRADE-MARK 11 mm H. I. PROJECTOR CARBON

• 10% More Light • Up to 25% Slower Burning

■ There *is* a noticeable difference in 10% more light. One of the circles above is as white as the paper it's printed on and is exactly 10% brighter than the other circle. You can *see* the difference, just as your customers can see the difference on your screen when you change to the new "National" 11mm x 20″ High Intensity Carbon.

The past few months have seen constant improvement in the line of "National" Carbons. New "Suprex" 7mm and 8mm Carbons, a new 10mm High Intensity Carbon and now a tremendously improved 11mm High Intensity Carbon to bring you still more light on the screen at minimum cost.

Prove to yourself that the oldest and most extensive arc-carbon research and development program does pay off for you — in quality *and* in savings.



THE PICTURE IS LIGHT... GIVE IT ALL YOU CAN WITH "NATIONAL" CARBONS

The terms "National" and "Suprex" are trade-marks of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY • **A Division of Union Carbide and Carbon Corporation** • ***30 East 42nd Street, New York 17, N.Y.***

SALES OFFICES: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco • **IN CANADA:** Union Carbide Canada Limited, Toronto

INTERNATIONAL PROJECTIONIST

VOLUME 31 SEPTEMBER 1956 NUMBER 9

The manufacturer of the Super Cinex describes the development of this new reflector arc lamp which is designed to use positive carbons as largs as 13.6 mm and operate at amperages as high as 165.

Development of the Super Cinex Lamp

By CLARENCE ASHCRAFT

C. S. Ashcraft Mfg. Co.

IT IS ONLY repetition to state that the greatest technical need of the motion picture industry today is improvement in screen illumination. This fact is fully realized by all, and it has been repeated time after time by writers in our national trade publications. A common-sense approach to this serious problem has been made by our company. As a result, a higher level of over-all screen brightness can be attained with our latest lamp than with any of our previous models.

Realizing that increased illuminating power is accompanied by higher film temperatures, improved methods of heat control were essential in order to project to the screen the maximum of *usable* light without focus-ruining film buckle. Another problem, entirely economic but nevertheless of great importance, was that of increasing screen luminance without materially increasing operating expense.

Practical Value

To achieve these goals, a simple modification of our previous projection lamp was not practical. We designed an entirely new projection lamp; a new power source closely coordinated with the requirements of this new lamp, and a new water-circulating heat transfer device for contact heat elimination.

Since the practical value of any new equipment is proved only after successful use in actual operation, we have delayed publication of this article regarding the Super Cinex until its value was thoroughly established beyond question in the three projection situations for which it was designed—35-mm projection in large indoor theatres; 35-mm projection in very large drive-ins, and for 70-mm film presentation. In each case, far more light, better light distribution and color quality were produced than was possible heretofore.



FIG. 1. The Super Cinex lamphouse showing external view of high-velocity blower and exhaust duct. The first prototype of the Super Cinex, then known as the "Cinex 170," was exhibited at the TESMA convention of 1954. Field tests were afterwards conducted over a period of a year to confirm the practicality of using the lamp with 13.6-mm carbons.

More than two years ago our company was approached regarding the possibility of designing a reflector lamp for wide-film (70-mm) projection that would be practical for daily theatre operation. We, at our own expense, began the design of an entirely new high-powered lamp for such a purpose (Fig. 1). Preliminary studies indicated that the lamp housing should be capable of withstanding temperatures created by a 200-ampere arc, and should contain a high-velocity air-circulation system to dissipate the heat from such an arc (see Fig. 2). Some method for thoroughly protecting the glass reflector from damage was essential, for instance. The problem of thoroughly cooling the silver contact jaws which transmitted the 200 amperes to the rotating 13.6-mm carbon was also of great importance.

Higher Optical Speed

Such a lamp could not, of course, be a laboratory experiment but had to be capable of a daily hard grind during long hours of operation in a theatre; it could contain no bugs, and it had to operate without the projectionist's continual attention. This lamp needed, therefore, to be self-regulating and not critical in the positioning of the arc spot at the aperture.

The first prototype of this new high-

powered arc lamp, then known as the "Cinex 170" was completed and exhibited at the TESMA convention in November, 1954, at the Conrad Hilton Hotel in Chicago. Into this lamp were incorporated many new features never before used in theatre projection lamps. For instance, the reflector diameter was increased to 18 inches with an accompanying higher optical speed of f:1.7. Lamps at that time were limited to f:1.9, 16-inch to 16½-inch diameter.

We built into the lamp a complete high-velocity air circulation system with injection and exhaust blowers as shown in Fig. 2. The forced air, passing through ducts which formed double walls for the lamp housing, maintained the entire structure at a low temperature even under the unusual heat conditions created by the high-current arc. An air stream was forced over the surface of the reflector to minimize damage from the arc heat. Into that lamp was also incorporated the principle of direct water cooling of the hollow silver carbon contacts.

Although the Cinex lamp of that time, the Cinex 170, was displayed with a 13.6-mm positive carbon, its use at the higher currents now required in many indoor and outdoor theatres was not encouraged. We had not fully determined at that time under what conditions the full benefit of the higher currents would be attained, or whether certain detrimental effects to projectors, film and lenses might ensue.

In fact, a year's further study was necessary before the lamp was actually placed in theatre service, and it was two years before we determined the exact conditions under which its optimum operation could be realized in the drive-in theatre. Finally, further study was also necessary for determination of conditions for its satisfactory use for 70-mm film projection —a use for which no reflector arc had ever been employed but, ironically, the purpose for which this lamp was originally designed. The years spent on this study were years well spent, for not only have the first installations of Super Cinex now been completed in large indoor theatres, in enormous drive-in theatres, and in theatres using 70-mm wide film, but each installation has been most successful, even exceeding expectations.

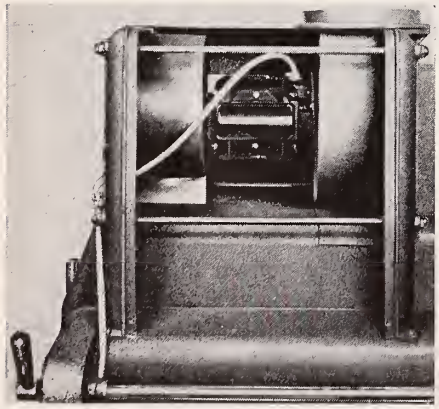


FIG. 2. Internal view with cover removed of blower compartment showing (at left and at the front of the lamp) the injection blower; (center) the drive motor; and (at right and toward the rear of the lamp), the exhaust blower.

By delaying the lamp's introduction we have been able to analyze and evaluate every phase of the many problems involved. We are now in a position to predetermine the light which should be projected to various sizes of screens. If this light does not reach the screen, there is a reason. We are now also in a position to make recommendations for correcting conditions at the installation which might prevent realization of the full benefits of the light actually produced by the Super Cinex lamp.

We have also determined the exact temperature of the light beam under all conditions and are able to maintain it at a safe level for film, projector, and lens protection.

By designing as a power supply the multiphase rectifier shown in Fig. 3, which is particularly adapted for operaton of the Super Cinex lamps, we can closely estimate the carbon and power consumption, and, also the current supply. This new power supply is the Super Cinex 12-phase rectifier.

Virtue of Condenser Lamps

From a modern point of view the condenser lamp has one characteristic that is of utmost importance to perfect projection. We therefore incorporated this characteristic into the design of the Super Cinex. It is the inherent ability of the condenser-type lamp to distribute the light more evenly over the film surface and, therefore, over the entire screen area than was possible, in the past, with a reflector arc. But in attaining better light distribution with the condenser lamp, brilliancy was lost. Only by piling on more current and burning more carbon could acceptable light be obtained.

The reflector arc, on the other hand, has many excellent features and only one which is detrimental. The reflector arc is unlimited in its possibilities. An extremely high screen brilliancy is attained at comparatively low arc currents and moderate carbon consumption. Furthermore, the lower power requirements of the reflector arc make possible its use with highly efficient rectifiers, whereas the high current condenser lamp is invariably supplied with current from motor generators in combination with power-wasting ballast resistors.

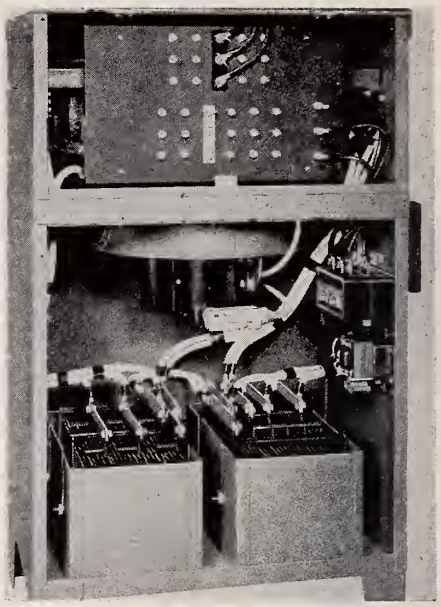


FIG. 3. Internal view of the Super Cinex 140- to 165-ampere multiphase rectifier showing enclosed heavy-duty selenium stacks, contactor switch, and exhaust fan.

The one deficiency we have experienced heretofore in the reflector arc is that we have been unable to distribute the light as evenly over the film area and the screen surface as was possible with the condenser-type lamp. In other words, the reflectors arcs of the past have had limited light distribution, whereas the condenser lamp has limited illuminating power. However, it is preferable for drive-in theatres to have a bright center light fading off on the sides and corners than a poor light over the entire screen surface.

The ideal light source, obviously, is one having the potential brilliancy of the reflector arc, only to a higher degree, combined with excellent light distribution. Carbon cost and power consumption should not increase materially over operating costs of the 11-mm projection lamp. Both objectives have been accomplished to a high degree in the Super Cinex light projection system. We get more light and excellent distribution at low operating

expense. Conversion of an ordinary lamp for use with larger carbons is inadequate, and the results might be quite disappointing.

A combination of a much higher brilliancy of the light projected to the film, properly controlled, and a larger light source properly condensed on the aperture area by a correctly designed optical system are both factors essential to the results attained by Super Cinex. To produce these results it is also essential that the increased heat within the lamp house be immediately dissipated by forced air injection and exhaust. Convection ventilation is no longer acceptable or possible.

Ventilation System

In the past, before the high-velocity air injection and exhaust system now employed on our Cinex and Super Cinex lamp was built into the lamphouse, it was left to the theatre to provide suction to the lamp-house stack. Either excessive or insufficient draft was the result, causing arc turbulence in some cases or overheating in others. This resulted in reflector breakage and accumulation of smoke deposit on the reflectors. Since the Super Cinex lamp employs up to 165 amperes maximum, and 145 to 150 normally, the built-in air circulation and exhaust system was designed for a 200-ampere arc, but the air flow and exhaust is carefully balanced to prevent any possibility of arc turbulence. Heat and smoke are removed as rapidly as generated.

In cooling the lamp, 750 linear feet of air per minute is passed over the correct position of the reflector, acting as a thin, invisible protective sheet only one inch in thickness but several inches in width. This air current not only maintains uniform heating of the reflector surface but prevents smoke or pitting particles from reaching the reflector to decrease its efficiency. (This is why, after eleven months of 15-hours-a-day operation at 150 amperes, reflectors are unbroken and show no deterioration). The exhaust is designed for a velocity of 2,000 linear feet a minute through a 3½-inch tube directly over the arc. The lamphouse, even at maximum power, remains cool.

At the top of Fig. 4 are shown three rectangles representing apertures. Superimposed on these rectangles is the magnified image of the carbon craters of 9- and 10- and 11-mm carbons. The

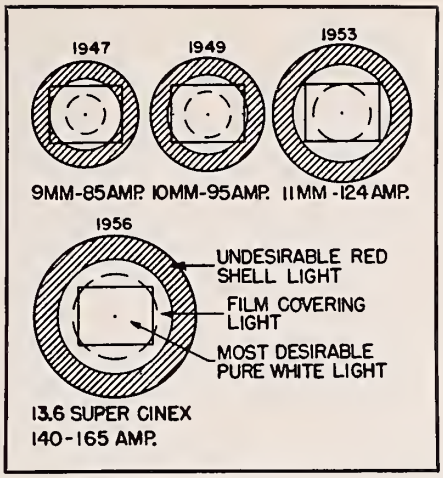


FIG. 4. Diagram showing the size of arc spot produced by carbons used in reflector lamps from 1947 to the present time. The 13.6-mm trim in the Super Cinex lamp is said to focus only the light from the bright core of the carbon on the aperture, with the result that distribution of the light from side to center of the screen is more even, and focus of the arc spot on the aperture less critical.

shaded area of these arc-spot images represents the useless and undesirable red shell light. The unshaded area inside the circle represents the light-producing carbon core, but only the center area of this core (bounded in the drawing by circular broken lines) contains the whitest and brightest light-producing part of the carbon core.

Larger Arc-Spot

Note how, by increasing carbon diameter and arc current, the red shell is moved out of the film area, producing a whiter light. Note the expansion of the desirable center core light, gradually covering more of the film area on the 10- and 11-mm carbon crater images; but never entirely covering the film.

At the bottom of Fig. 4 is shown the Super Cinex carbon crater image where nothing but the best of the core light covers the film area. The entire core light is much larger than the aperture, resulting in uniform screen light, and non-critical arc adjustment; there is no opportunity for the red shell light to enter the film area. There is no hot spot or concentration of heat in the center of the film to cause focus- and film-ruining embossing or buckling.

With arc adjusted relative to the reflector to produce maximum center light, the following light distribution

(*Continued on page* 30)

Thrillarama Show Opens in Houston, Texas

Thrillarama, new born cousin to Cinerama, Cinemiracle, and Todd-AO, underwent its public baptism of light recently at the Metropolitan Theatre in Houston, Texas. Cast into a travelogue format, the first effort of this new wide-screen, curved-screen process received both praise and blasts from a capacity first-night audience including a number of top motion pic execs. On the positive side, theatre men pointed to its low cost and portability, as well as its potential for future development. On the negative side, it was generally agreed, among other things, that a seam in the center of the screen was all too visible.

The Thrillarama process employs a dual set of cameras, a dual set of projectors, and a deeply curved 3½-to-1 ratio portable screen. A pair of conventional projectors are locked together and operated simultaneously with crossed beams, each covering half of the screen surface. With the sound track on a separate reel, the two pictures are mated together on the screen in the Cinerama manner. Magazines containing 5,000 feet of film are used, changeover requiring a short intermission.

Like the Cinerama travelogues, "Thrillarama Adventure" takes its audience on a varied geographical excursion. Without so much as packing his suitcase, the viewer is transported from the Florida everglades to a winter carnival in Canada, then to the scene of a dare-devil auto spectacular, and then south of the border to a colorful view of Mexico, to mention just a few of more delightful sequences.

Unfortunately, some of the first-night viewers were troubled by distortion and other technical defects. An Associated Press correspondent reported that "islands melt like Dali clocks, water is seen to flow uphill and an aerial blimp the Thrillarama camera follows on a trip through the everglades is oddly warped. . . . At the center there is a readily perceptible seam. . . . No sensation of depth emerges. . . ."

Hollywood reporter Jimmy Starr wrote: "Thrillarama's immense screen captures the corner vision of the eyes and makes the viewer feel he is actually 'in' the picture. . . . There are several 'buts' in this new process which can be corrected."

The latest report is that Thrillarama had to shut down a week after opening because of temporary mechanical difficulties.

Magnetic Tracks on Release Prints

By ROBERT A. MITCHELL

In the second and concluding article of this series, the author describes how rough handling and even ordinary use can considerably reduce the reproductive efficiency of magnetic striping.

THE PROJECTOR, itself, is a potential source of danger to magnetic-track prints. The tracks must pass, not only through the penthouse reproducing head, but also through the picture mechanism and optical soundhead. The use of a separate sound film (as in "showcase" processes and the old 3-D) would insure better sound results with far less deterioration of the tracks; but the expensive and rather troublesome method of synchronizing separate picture and sound strips is out of the question for the average theatre.

Much of the sound deterioration and picture scratching in magnetic-sound prints may be attributed to the magnetic tracks, themselves. Abrasive particles of magnetic iron-oxide powder rub off from new prints and collect upon the sound-magnet pole pieces and the projector gate. These deposits of magnetic powder usually decrease after a month of projection use has "broken in" the new print.

When the magnetic powder collects upon the sound-magnet pole pieces, serious attenuation of the higher frequencies occurs. All film-contacting parts of the fire-valve boxes, the penthouse reproducers, the projector mechanisms, and the optical soundheads must therefore be cleaned after each reel of a new print has been shown. A lint-free cotton rag should be used for cleaning, as the magnetic deposits are usually mixed with oil and sticky film wax.

Accidental Erasure

Attenuation of the sound by erasure of the soundtracks may result from contact of the tracks with magnetized steel sprockets, pad rollers, idlers, fire-valve rollers, and film runners or track shoes. Sprockets and pad rollers, in particular, often introduce interfering noises. A magnetized intermittent sprocket, for example, often introduces the whirring noise of the intermittent movement into the tracks, and once it is there, it cannot be removed.

Even non-magnetized steel sprockets, rollers, etc., bring about a gradual weakening of the sound record in the magnetic tracks they contact. While the sound signal can never be entirely destroyed by contact with non-magnetized iron, the attenuation may soon become severe enough to require an increase in volume setting with an accompanying increase in ground noise and decrease in the dynamic range, or signal-to-noise ratio. The quality of the reproduction then becomes very poor.

Degaussing Mandatory

Much more serious, of course, is contact of the tracks with *magnetized* steel projector and soundhead parts. The precaution of demagnetizing such parts is thus a necessary safeguard in theatres making use of magnetic-track prints.

The terms "demagnetizing" and "degaussing" mean the same thing. (Karl Friedrich Gauss was a German mathematician and physicist after whom the unit of magnetic field strength was named.) The degaussing process is simple: a boy who removes magnetism from his jackknife by passing the blade over the iron pole of an AC electromagnet is doing exactly the same thing as the projectionist who passes a degausser, or AC "electromagnetic brush," over the sprockets and idlers of his projectors.

The degaussing of fire-valve rollers, penthouse reproducer rollers and magnetic pickups, all sprockets and sprocket teeth, all gate film-rails and tension shoes, and the optical soundhead scanning drum, rollers, guides, etc., should be done thoroughly every day before magnetic-track CinemaScope films are run. Sprockets and rollers made of non-magnetic alloys do not require degaussing.

A thorough job of demagnetizing should be carried out each time projector or soundhead parts are replaced or adjusted with the aid of steel pliers, wrenches, or screwdrivers. Projectionists' tools are very likely to become magnetized by proximity to rectifiers, motors, arc-lamp magnets, etc., and also require a frequent once-over with the degausser.

Failure to demagnetize projector parts can be disastrous to magnetic sound tracks. Neglect in this respect may ruin a brand-new CinemaScope print. If the sound volume appears to get weaker at each showing of a print, the projectors should be degaussed and the magnetic soundheads checked for output. The trouble may actually reside in the amplifiers; but there's always a chance that magnetic fields in the projectors or deposits of magnetic powder on the sound-magnet pole pieces are damaging the soundtracks.

Testing Magnetic Heads

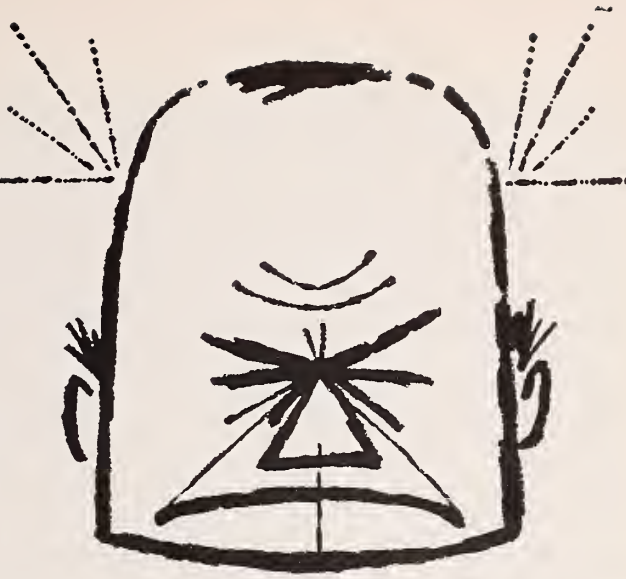
In all cases of noise pickup by magnetic tracks, the damaged film should be run through the entire projector, and the individual track outputs tested one after another. If all four tracks suffer from the same interference, it is obvious that large areas of the film path are magnetized. Interference in a single track indicates a magnetized pickup head or, as is sometimes the case, a magnetized sprocket tooth.

CinemaScope sound test films having 8,000-cycle tracks are used for checking the outputs of the four pickup heads individually. The center, left, and right channels should have equally strong outputs: differences greater than 2 db indicate uneven head wear or

What Is Your Opinion?

Readers of the current installment of Mr. Mitchell's article on magnetic sound will find that he has grave doubts as to its value for theatre sound reproduction. He expertly documents a viewpoint that is contrary to the opinion most widely held in the industry—that magnetic sound is far superior in terms of fidelity of reproduction to the older optical system of sound reproduction. Based on your experience in your theatre, what is your opinion? Readers' comments are invited.

EQUIPMENT WEAR AND TEAR
GOING TO YOUR HEAD?



RCA INTRODUCES BRAND NEW SAVINGS IN REPLACING WORN MAGNETIC HEADS

Time was when a complete magnetic cluster had to go whenever pick-up heads wore out in your sound system. But not any more, thanks to the latest development by RCA theatre-equipment engineers. RCA's new magnetic cluster—designed to fit *any* RCA button-on soundhead—introduces a removable cap that means hefty savings on that old problem of pick-up heads that wear out. Here's how it works.



Here's your original magnetic cluster, the unit you previously had to replace entirely. Now, you can insert a new cap at a *fraction of the cost* of the whole cluster.



Here's the heart of this new RCA development . . . the removable cap that incorporates fresh pick-up heads for reproduction of one or four magnetic tracks.



And here's your end result . . . a cluster working like new because it has brand new pick-up heads. You've saved plenty of money and time, thanks to RCA engineering.

This replaceable cap typifies the way engineers work things at RCA. They make the best product possible, then go on improving it, finding ways to make it work better and longer and easier. This all means better business for you . . . and the sooner you call your independent RCA Theatre Supply Dealer the better. He's ready to help you start saving with RCA's new magnetic cluster cap.

RCA®

THEATRE EQUIPMENT SALES
RADIO CORPORATION of AMERICA
CAMDEN, N. J.

the Line that builds Lines at Your Box-Office

RCA THEATRE EQUIPMENT

improper adjustment of the cluster unit, the impedance rollers, or the pressure rollers.

Magnetic-sound test films having 12,000-cycle tracks are used for checking the high-frequency response of the sound magnets. While magnetic reproducers in perfect condition are capable of reproducing somewhat higher frequencies than 12,000 cycles (as are optical soundheads, also), satisfactory sound reproduction does not require a frequency response exceeding 8,000—10,000 cycles. Nevertheless, a lack of response from 12,000-cycle test tracks indicates a need for immediate replacement of the magnetic pickup cluster.

It is absolutely necessary for the fourth, or auditorium sound-effects, track to reproduce 12,000 cycles when auditorium speakers are employed. A signal of this frequency is used as a "control" for the automatic electronic switch that turns the fourth-channel amplifier output on and off. This channel is admittedly an unsatisfactory adjunct to motion-picture sound, and is preferably disconnected from the penthouse reproducers and used, with discontinuance of the electronic switch, for playing phonograph records before the show and during intermissions.

Upkeep of Magnetic Heads

Even though magnetic soundheads are simple in principle, their maintenance is more costly than the upkeep of optical soundheads. Optical sound reproducers require frequent focus tests (which cost nothing) and periodic replacement of exciter lamps (at the cost of pennies), whereas magnetic sound reproducers require replacement of the magnetic pickup cluster unit after every 3,000,000 feet of film, on the average—once a year in the case of 10 hours of CinemaScope projection per week, per projector. Cluster units cost more than one hundred dollars apiece.

The output and frequency-response characteristics of a new pickup cluster improve slowly during the useful life of the unit, afterward deteriorating very suddenly to a point where output is only a small fraction of normal, and all high-frequency response is lost. Sound distortion then becomes intolerable.

Several manufacturers of CinemaScope magnetic clusters claim a useful life of about 6,000,000 feet of film; but even so, replacement of these units is inevitable. The photoelectric cells of optical soundheads are considerably cheaper and last much longer.

Development of a truly permanent cluster unit is impossible. Even hard-plated pole pieces are eventually worn down by the abrasive action of magnetic tracks and the pressure of film running under great tension. It is to be noted that the sound-reproducing performance of sound magnets is impaired by hard platings and the use of hard magnetic alloys in place of soft iron.

Damage from Sprockets

The use of narrow-tooth sprockets for "Foxhole" prints can be a source of film damage. Still another source of film damage is the increased complexity of the film path, with a number of extra idlers and pressure rollers as well as heavy impedance film drums in the penthouse soundhead. Many soundheads of this type also have a toothed sprocket which is turned by the film, itself, and is thus indirectly driven by the upper feed sprocket of the projector mechanism. When normal upper-reel tension is employed to prevent "coasting" of the feed reel, this arrangement is rough on the film perforations.

The impedance and tension rollers, in particular, have a tendency to inflict a large number of fine scratches in the emulsion of the film. "Cupping" of the film at the pole pieces of the magnetic pickup will scratch the celluloid side of the film in the picture area. Film tension at this point is greater than at any other point in the entire film path, not excluding the projector gate. No wonder, then, that prints played through magnetic soundheads are sometimes marred by "showers of rain!"

Bypass Optical Soundhead

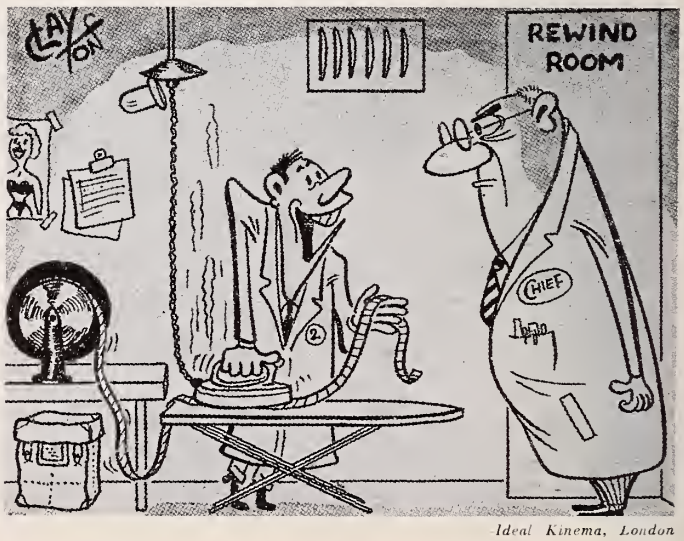
It is suggested that magnetic-sound film be threaded to bypass the scanning drum and sound sprocket of the optical soundhead whenever the layout of the soundhead permits direct passage of the film from the lower sprocket of the projector mechanism to the lower takeup sprocket of the optical soundhead. (A shortened film path is usually impossible when old gate-type soundheads are used.)

Similarly, optical-track prints should bypass the impedance rollers and magnetic pickup unit of the penthouse soundhead to avoid possible damage. The bypassed film course should be carefully checked, however, since great damage will ensue if the film rubs against any part of the fire-valve box, the penthouse, or the picture-mechanism frame. Double-check the film path while the machine is in operation—the next projectionist to receive the print may dislike scratched film!

Contrary to popular opinion, the frequency range offered by CinemaScope magnetic tracks is no greater than that of well-made optical tracks. The practicable top frequency in either process is 15,000 cycles, with 12,000 as an easily obtainable norm and 10,000 as the highest frequency to be reproduced by the theatre speaker system. In fact, a top cut between 8,000 and 9,000 cycles by the amplifier filter network is often considered desirable as a noise-reducing expedient.

Also contrary to popular opinion,

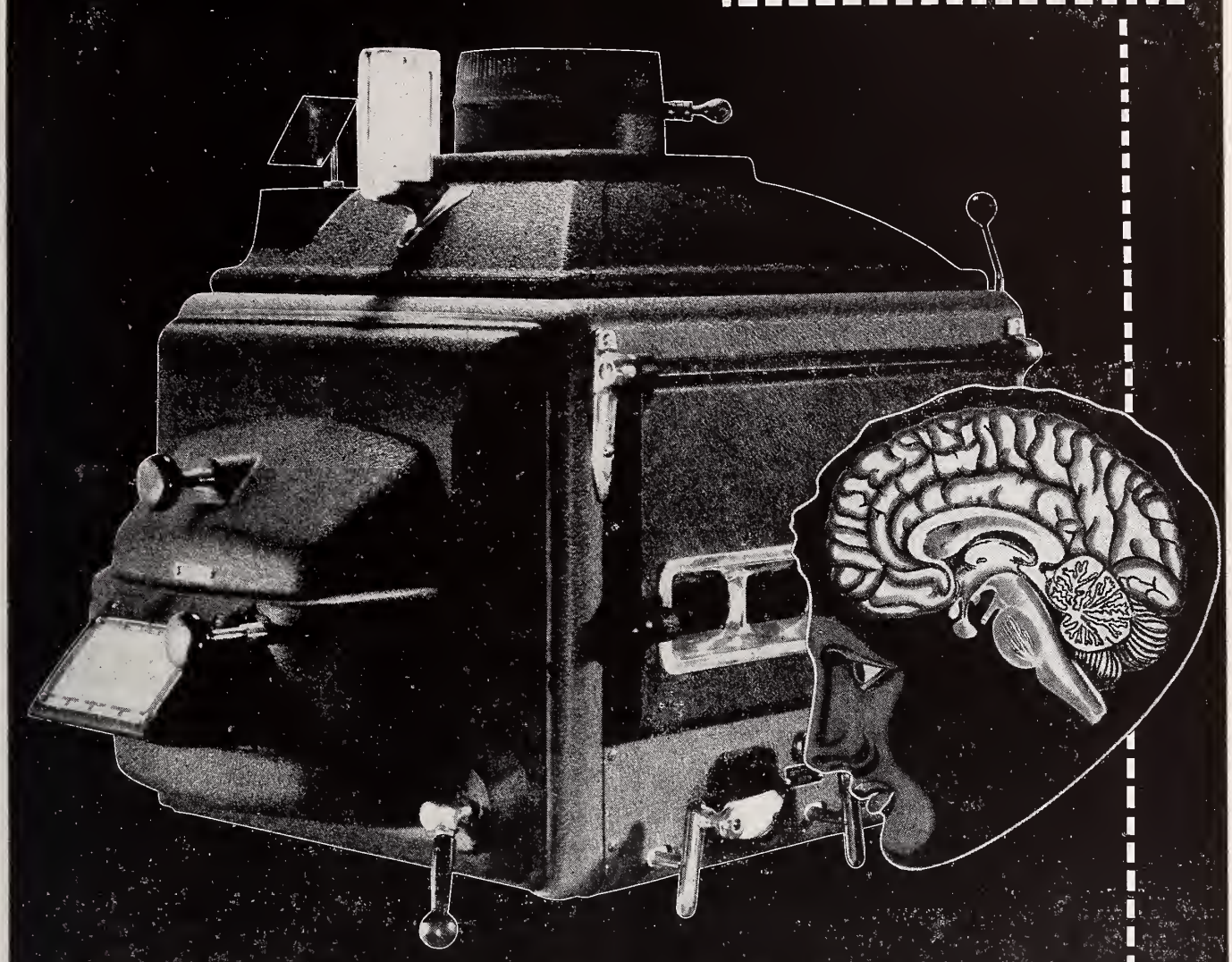
(*Continued on page* 33)



"The film was warped, Chief."

Ideal Kinema, London

The Lamp with the Built-In Brain



EXCELITE "135"

The automatic crater-positioning system which controls the burning of both carbons is nothing short of amazing in its maintenance of the positive arc crater at the EXACT focal point of the reflector. In fact, it even defies you if you try to keep it at any other position.

In these days of involved projection techniques and more exacting demands on screen light sources, you can't afford to have less than an arc which projects an intensely brilliant light, evenly distributed and of unchanging color value.

And that's exactly what you get with the Excelite "135" WITHOUT MANUAL ADJUSTMENTS. No wonder exhibitors and projectionists alike prefer them regardless of screen size or projection process.

DISTRIBUTED BY N.T.S.

NATIONAL THEATRE SUPPLY
Division of National • Simplex • Bludworth, Inc.

A SUBSIDIARY OF GPE

What Causes Poor Projection?

The public and also many people in the industry are unaware of why it is difficult to get a good screen image in some theatres.

By JAMES MORRIS

FOR the past several years we at IP have received numerous letters from projectionists declaring that no matter how they try, it is impossible to keep pictures in focus at many theatres. The writers of these letters were honest, conscientious men who did their best and failed through no fault of their own.

Three letters received and printed by the well-known entertainment trade paper *Variety* in recent weeks also dealt with the problem of focus in theatres as well as other technical matters. However, these letters were not written by projectionists but by moviegoers who, presumably, had some connection with the entertainment business since they addressed themselves to *Variety*. The letter writers were familiar with Hollywood descriptions of what the new technical processes are supposed to accomplish and bitterly critical of exhibitors, managers, and projectionists, lumping all together as villains responsible for the ailments of the industry.

Feels No Sympathy

One letter stated in part:

"When I read of the plight of the theatre owner today, I find it difficult to remember he's a fellow human, and my reactions are those of a once-frequent moviegoer. I remember many incidents that spanned the three or four years during which I made the transition from a two or three-time-a-week attendee to my present state, which is once a month, at most.

"I remember, for instance, the innumerable times I made the long trek back up the middle aisle to tell the usher that the picture was out of focus. He usually informed me I was sitting too close, or that my eyesight was probably bad.

"I remember the time my wife and I sat behind four youngsters who were raising all kinds of hell. I went back to see the manager who suggested that we change our seats, as there were others available."

Another letter writer was highly disturbed over the way that CinemaScope Features have been squeezed into prosceniums of theatres not designed for such a wide picture in the first place. When he went to see Marge and Gower Champion in "Jupiter's Darling," he claimed to have had the following experience:

"I arrived, by habit, a few minutes before the feature began. When it began most of the film titles and credits were illegible: the first and last few words of each line were either off the screen or not projected within the narrow limitations of the screen. Obviously, the film was not an honest CinemaScope exhibition. I tolerated the mutilation until the Champions' first dance routine, until Marge and Gower, alternately and together, disappeared beyond the side edges with a rapidity that was ridiculous. Then I walked out. En route to the street I reminded the manager (or an antagonizing appointed representative) that the theatre was advertising a screen process that was not being exhibited. I was indifferently advised that 'you tourists better stick to Broadway.'"

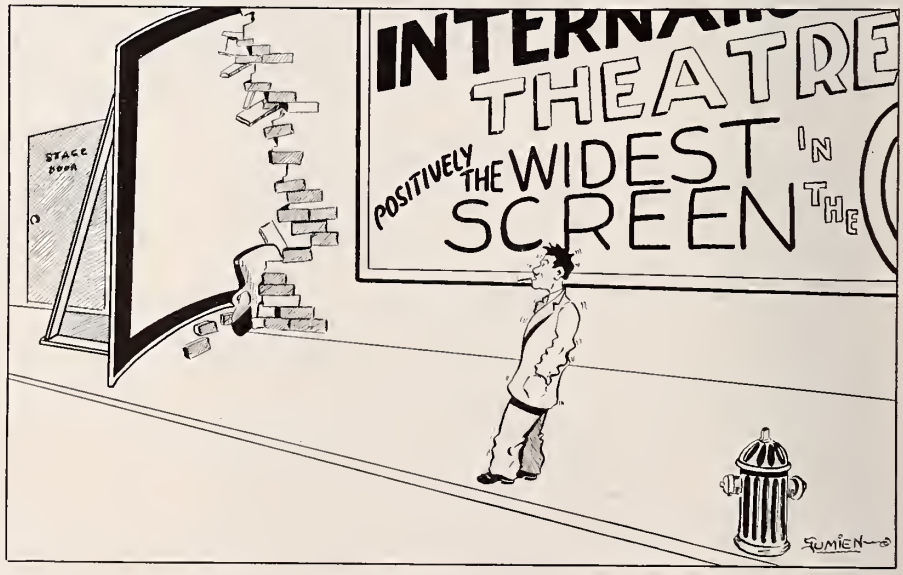
So much for CinemaScope images that are cropped at the sides. On another occasion the writer of the same letter went to a theatre where he was dismayed to find the CinemaScope too long and narrow.

Ribbon-Like Screen

"I arrived, as usual," he writes, "some minutes before the advertised CinemaScope picture was to be shown. I was pleased with the dimensions of the new wide screen used for the secondary B picture. Then the feature for which I had been waiting appeared on an absurdly modified screen: the height was reduced, the width unchanged."

The letters to *Variety* evidently voiced long-standing grudges. Another complaint was that 3-D was ruined by resistance to it on the part of projectionists. One letter described a bitter experience when the writer attended a showing of the "House of Wax."

"The projectors were completely out of synchronization," the letter stated. "At one point, one projector broke down, and the other continued to show its print on the screen. The 3-D illusion was not only shattered, but everybody got a headache, thinking it was the glasses that did it. When I complained to the manager, I was shrugged off



By Louis Sumien, member of Local 640, Nassau & Suffolk Counties, N. Y.

The cartoon above dramotizes the plight of both projectionists ond exhibitors in narrow theotres where a full-width CinemaScope image is impossible without reducing the height of the screen image till it assumes ribbon-like proportions. If all complaints were to be satisfied, it might be necessary for projectionists to get busy with picks ond crowbars and knock down theotre walls.

as some kind of nut. 3-D was a wonderful process — properly projected. For my money the only real illusion of depth seen on the screen."

A final objection voiced by the letter writers to *Variety* concerned stereophonic sound. Why, one asked, do theatres attach streamers to their marquees advertising stereosound and then run the picture with just one optical track?

All in all, the opinions voiced in the letters were enough to set any projectionist's teeth grinding to a degree that would drown out the sound of the most noisy old projector. Anyone who has actually operated in a projection room since the introduction of the new processes could quickly answer these complaints.

Projectionists' Viewpoint

First of all, as as been consistently stated by projectionists from all over the country who have been writing to IP, it is just about impossible to keep pictures in focus in many theatres. Wide curved screens, short throws and steep projection angles create optical problems in some houses that nobody has figured out how to solve. This can be said without even taking into consideration the fact that film will flutter and buckle under the heat of the powerful arcs needed to adequately illuminate big screens.

Furthermore, what can be done about the fact that CinemaScope pictures cannot be fitted into the proscenium of many theatres without either drastically cropping the sides of the picture or else reducing the height until there is an objectionable ribbon effect on the screen? Are projectionists and managers to take picks and crowbars and make a big enough hole in the sides of their theatres to let the screen extend out into the street?

The old refrain about projectionists ruining 3-D has long since grown whiskers because, when the 3-D situation is examined in retrospect, it becomes obvious that projectionists deserve great credit for getting the hastily conceived and technically dubious 3-D process to work at all.

The writers of the letters apparently do not realize just how difficult it is to keep two projectors locked in sync, often with crude mechanical interlocks, and at the same time worry about the whole business getting out of sync anyhow because the girls at the exchange were up to their ears in double prints and didn't have the time to count the frames removed when making splices.

Facilities Lacking

Neither the production, distribution, or exhibition facilities of the motion picture business were properly set up to handle 3-D. The pictures were often photographed in such a way that the only result of watching them for an hour or longer would be a severe headache no matter how well the film was projected. The exchanges weren't able to cope with it, as was mentioned above, and the theatres didn't have proper equipment or sufficient manpower.

Another point with regard to 3-D concerns a matter that IP rarely comments on—the entertainment value of 3-D pictures. Producers seized upon the process as a gimmick that would sweeten up any tired old story dredged from the bottom of their filing cabinets. Just as long as a few spears or

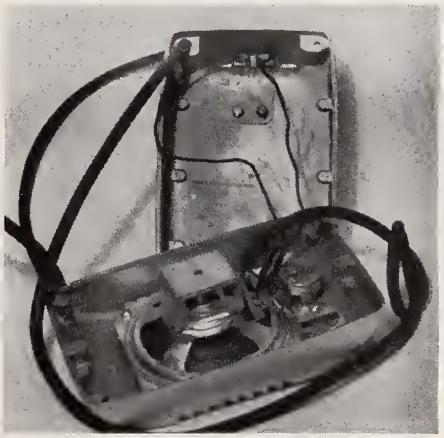
(*Continued on page* 31)

Speaker Control For Drive-Ins

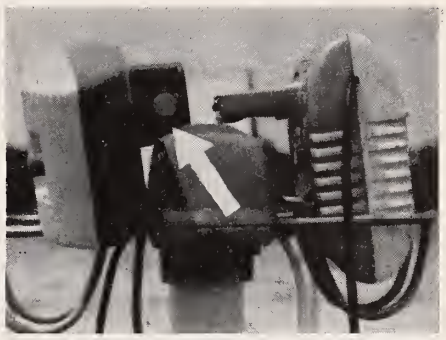
Neglected or "leaking" speakers in drive-in theatres, are a problem which operators are concerned with, generally. Speakers are a common source of complaint from neighbors and police in residential areas. Many patrons forget to shut off the power after viewing the show and speakers go on "leaking," wasting current and annoying neighborhoods with noise.

Onnig D. Melkon, projectionist at a drive-in theatre, Braintree, Mass., was requested by his employer to handle an aggravated problem of this kind. At this theatre, a man had to be detailed to make a two-hour tour to check whether speakers were turned off and residents in the area made repeated complaints to the management.

One day, the owner, Julian Rifkin, said to Melkon, "You are a good gadgeteer, why don't you come up with some idea to turn the sound off when the speakers are not in use?" Inventor Melkon has been a projectionist since 1910 and is presently a member of IA Local 437, Brockton, Mass. He has served as Arctic motion picture photographer with Macmillan and Byrd in 1925 and also has run a motion picture laboratory. Drawing upon his background and ingenuity, he devised an automatic speaker switch,



Open view of speaker displaying installation of switch near top and wires to volume control.



Arrow points to push-button of new automatic switch which projects under arm-cotch.

patented in July 1956, as an outcome of experimentation along lines requested by his employer.

Of basic, simple design, the switch uses a leaf-spring contact actuated by a push-button control to open or close the electrical circuit of the speaker. The switch is installed under the arm-catch which goes over the car-door ledge or window. It has a protruding button which comes through the casing. The switch is wired into the volume control of the speaker and the button in normal position keeps the speaker turned off. When attached to a car, the button is pressed in, turning the speaker on. When lifted from the mount of the door, the button is released, thus assuring automatic discontinuance of operation.

Whether the patron replaces the speaker in the ramp cradle with volume on or off, or even if he leaves the speaker lying on the ground, it does not affect the shut-off switch which depends on the speakers being in operational position on a ledge, before it can work.

Although there are a variety of speaker types with different body and casing designs which *might* present some installation problems, the inventor claims that the switch is adaptable to all makes and should offer no serious installation or maintenance difficulties. Now in production, the switch is expected to retail for about one dollar per unit and should be on the market in a few months.

Union heads sound confident note in their review of past achievements; are meeting future technical issues in head-on style

IATSE Convention Keynote Is Unity On Industry Problems



IA President Richard F. Walsh

IN AN amicable atmosphere infused with a general air of quiet confidence, more than 1200 delegates attended the 43rd IATSE convention last month in Kansas City.

Leading off the rostrum of speakers was George Meany, President of the AFL-CIO. It marked the first time since the historic merger of the two unions that, an Alliance convention has been addressed by the combined union chief. Meany expressed general satisfaction with the AFL-CIO coalescence, indicating that a few overlappings and seams needed only time to be ironed out. Labor has now been welded into a solid bloc of 15 million organized men and women and stands on pillared strength. IA President Richard F. Walsh put it this way: "We have forged an instrumentality which should enable the labor movement to attain its full stature."

Meany struck out against the Taft-Hartley bill, mentioning that employers are not using it as a weapon now because this is a time of high employment, though they could use it to hurt trade unions if times were bad. He discussed the right-to-work laws whereby the non-union man who does not want to pay dues has the right to work along side the union man, thus threatening the status of the union shop in general.

Political Facts of Life

Meany urged the convention to exercise its right to vote and make democracy work a little better, by preserving the civil rights of all people and not creating second-class citizenship groups.

Adding to his statement, President Walsh said he wanted to "bring the political facts of life home to the membership." Since the merger of the two unions there has also been created a combined labor press—The AFL-CIO News. Its columns every week underscore vital truths which the dalies thoughout America twist or bury or ignore. Along with the renovated newspaper is also a new political action unit in COPE, the joint committee on political education. Members were urged to support COPE financially as a "very inexpensive form of job insurance."

President Walsh was elected unanimously to continue in his post as chief of IATSE. In a general summing up, Walsh sounded a note of assurance when he said. "The Alliance today, faces no major crises, though it has to struggle against a far-from-sympathetic administration in Washington and against anti-labor feeling in some states. The Alliance is also still adjusting to the impact of TV on the industry . . . membership and organizational activity is increasing in this sphere."

Projectionists, Walsh noted, have faced the toughest problems in the last two years. This group has borne the brunt of TV competition and other unstable conditions. Walsh was happy to note that unemployment here has been largely taken up by the ever-lengthening drive-in theatre season. He also feels that technological changes in the movie field may have further effects not yet anticipated and would bear vigilance.

A gesture of concerted action was



IA officials being sworn in office by William F. Canavan, former International president. Left to right: John A. Shuff, 8th vice-president; Hugh J. Sedgwick, 5th vice-pres.; Jack Hartree, delegate to Canadian Labor Congress; William C. Scanlan, trustee; Harry J. Abbott, 3rd vice-pres.; William Donnelly, 7th vice-pres.; Orin M. Jacobson, 4th vice-pres.; General Secretary-Treasurer Harland Holmden; James McNabb, delegate to AFL-CIO; R. E. Morris, trustee; President Richard F. Walsh; Carl J. Cooper, 2nd vice-pres.; Canavan; James J. Brennan, 1st vice-pres.; Louise Wright, 9th vice-pres.; Albert S. Johnstone, 6th vice-pres.; George W. Brayfield, trustee; Thomas V. Green, delegate to AFL-CIO.

made with a plea for the elimination of the federal tax on admission to motion picture theatres. The tax is held to be burdensome to exhibitors and reductions are needed to help stem the tide of theatre closings. Some relief has been obtained with the abolition of tax on tickets costing ninety cents or less. The Treasury department has estimated a saving of 60 million dollars annually for exhibitors on this item. Most of the relief will go to small houses which have the greatest need for it. Campaigns for the complete repeal of federal tax will continue. Rep. Bolling of Kansas, D., pledged that a bill to wipe out the tax completely would be introduced at the next session of Congress.

Another stellar move in the direction of labor-industry cooperation was a resolution requesting a review of the anti-trust ruling forbidding producers from owning theatres. This unprecedented step was motivated by the producers changed attitude: a loss of interest in where his product will be shown and concentration on films for TV. Since this hurts theatre owners, it consequently affects their employees. Most significant TV development has been the big increase in the percentage of programs being produced on film.

IATSE scored a triumph in elimination of dual unionism in the TV field when the motion picture cameramen employed by the Columbia Broadcasting System in New York, voted unanimously to make IATSE Local 644 their collective bargaining agent. Many film programs originate now at local TV stations. This is an area in which the union is trying to gain a foothold in such places where they have not been previously represented.

Threat from Technology

Nationwide television contracts have also been won in many cases where new technological devices, such as closed-circuit TV, have broadened the base of industry. Contracts have also been signed with the Teleprompter Corporation and with the Cellomatic Corporation. These firms make traveling or specialty devices which employ projectionists, who have now been union-scaled. Another new device that commands the attention of the union is motion pictures on magnetic tape. This invention, while still in the trial stage, may have significant effects later on in the broadcast or projection of film, whether in the theatre or on TV.

"Fortunately," commented Walsh, "There is every indication that whenever pictures on tape go into large-scale production, they will be turned out by producers with whom we have already established good contractual relationships." In a taking-the-bull-by-the-horns maneuver, understandings have been reached with major Hollywood producers covering the eventuality of contracts extending to pictures as well as sound tapes. Thus, the control of motion pictures on tape, has been insured and this, Walsh points out, may be of "vital importance to the future of the Alliance."

Merle Chamberlin, chief projectionist for M-G-M, also addressed the convention at some length on the subject of technical innovations in the movie industry and the need for standardization procedures. Highlights of Chamberlin's remarks follow.)

Merle Chamberlin's Talk to IATSE On Current Projection Problems

THE so-called technical revolution that set us on our collective ears has settled down to a point where we should now have a pretty good idea what is going to be the big answer. Standardization (at least as standard as I think it ever will be) seems to have arrived.

Wide-screen aspect ratios are leveling off at 1:85 to 1. I will admit that non-anamorphic films are not all projected at 1:85 to 1, but wide-screen product is being photographically composed at that ratio. You can feel perfectly at ease in informing your members that non-anamorphic, wide-screen pictures can be tied off at 1:85 to 1. In cases where keystone is a part and parcel of the projection installation, compensating masking adjustment and aperture filing will cut that ratio down a small amount, but in all cases, the projected picture will be much more pleasing if we all start at the same ratio point in the projector head.

Anamorphic (CinemaScope) ratio is closer to where it should have been all along. Now that most CinemaScope prints have optical tracks, the actual photographic ratio ends up on the film at 2:34 to 1. With proper masking our projected CinemaScope picture should be close to 2:25 to 1. I think we will agree that this ratio change will contribute materially to eliminating the 'viewed-through-a-mail-slot' effect of many CinemaScope presentations.

Our biggest projection headaches have been light level, excessive grain and poor definition. Where higher light level is available, we naturally have a higher heat-on-film level to combat. This temperature rise at the aperture invariably results in even poorer definition, due to film buckle.

The Curved Film Gate

An item of equipment to help us on the definition problem is the curved gate. Two manufacturers state that they are going to fabricate curved-gate kits for projectors. This is something many of us have advocated for a long time.

The Motion Picture Research Council made exhaustive tests and held a comparison demonstration of flat gates versus curved gates on August 1. Results were conclusively and overwhelmingly in favor of the curved gates. Definition was greatly improved; buckling was materially reduced, and the entire presentation of the picture was enhanced via the use of the curved gate.

Simplex has announced curved gate kits for their X-L projectors; and PanaVision, makers of the Panatar anamorphic lens, have announced that kits will soon be available for other projectors.

To the best of my knowledge there are two experimental or prototype sets

1.85 to 1 Ratio Opposed

One Hollywood director quickly raised an objection to Merle Chamberlin's statement at the IATSE convention that the aspect ratio for all non-anamorphic projection will soon be standardized at 1.85 to 1. George Stevens, who recently completed "Giant," a big-budget epic about life in Texas, declared that this film was photographed for projection at 1.66 to 1 aspect ratio. He believes that the latter proportions are more pleasing and practical than 1.85 to 1 and feels that the most desirable screen image must have height as well as width.

of these gates in actual theatre operation today. One set is in the Roxy in New York; the other one, in the Chinese in Hollywood. Both theatres are running "The King and I." The Roxy set of curved gates is Simplex, while the Chinese set is from PanaVision. Reports from both theatres are enthusiastically in favor of the continued use of the curved gates. In my opinion, this proves to be a major contribution toward the elimination of previously seemingly insurmountable projection problems, so I believe it behooves us to encourage acceptance of this projector modification.

New carbons, planned shorter intermittent pull-downs and other innovations in various stages of development show us that the equipment people are doing all within their technical power and knowledge to extend assistance to us in the field. I realize that the final decision to purchase these improvements rests with the exhibitor, but I believe that we can help him sell a better presentation, if we make the proper approach.

We have heard that the manufacturers have not fallen asleep on us. But what has the production end of our industry been doing about these same reproduction problems?

We should never lose sight of the fact that every right thinking person connected with the production of motion pictures realizes that we, the projectionist members of our International Alliance, control the neck of the bottle. Every iota of blood, sweat, tears, money and ulcers that goes into the making of a motion picture is for naught if the reproduction of that motion picture is not enjoyable.

Better Release Prints

It follows that if the producer can make our presentation jobs easier by a practical improvement in print quality, it behooves them to do just that. The obvious first step toward that print quality is a larger negative. That is the direction in which we are headed. You have seen and projected the improved 35-mm wide-screen prints from the large VistaVision negative and the improved 35-mm CinemaScope prints from the large CinemaScope 55 negatives. There is still more improvement to come. M-G-M's first release from a large negative will be "Raintree County," now being photographed in the M-G-M Camera 65 process.

All of these processes use the same basic principle, but we feel that, from the standpoint of quality and flexibility our, comparatively speaking, long-range research has resulted in what we hope you will consider to be the cream of the crop. We at M-G-M have always sincerely appreciated the high opinion of our release prints as consistently expressed by projectionist members of our Alliance. We feel we are keeping faith with that high opinion with our new M-G-M Camera 65 process. All research on this project was under the direction of our technical research department, headed by Douglas Shearer. I will endeavor to make you more familiar with this process with a short explanation.

M-G-M's 65-mm process is the result of years of study and experimentation —in progress ever since M-G-M first used wide-screen effects in filming "Billy The Kid" in 1930.

Primary aim of the research program in recent years has been the production of a better 35-mm CinemaScope release print having sharper focus and free from distortion and grain. Optical equipment which has brought the principles underlying the 65-mm process to physical reality was produced, after intensive research, by PanaVision, Inc.

The new process is filmed with cameras having conventional-type mechanism, modified to handle negative film that carries an image twice the width obtainable on 35-mm film. Because of its size, a single negative filmed in 65-mm may supply any or all of the following:

Versatile System

1. Super-roadshow prints utilizing the full 65-mm frame in 3-1 ratio of width to height—filling the largest screens available today, and capable of filling still larger screens with a picture providing complete audience enjoyment from any seat in the theatre.

2. Roadshow prints in the dimension of Todd-AO's 2¼-1 or the horizontally-projected double frames of 2-1 large-screen VistaVision.

3. Standard 35-mm prints in CinemaScope for general release.

4. Standard 35-mm prints for wide-screen or normal screen projection for general release.

Comparable advantages are offered the exhibitor. He is able to screen an improved picture with his present facilities. Optically-reduced 35-mm prints will be available to him for CinemaScope, wide- or normal-screen showing. If he has the screen area and audience capacity to handle a roadshow of the 65-mm print, then he will be able to display it.

Thus our new process achieves its primary and immediate objective of presenting a CinemaScope or wide-screen picture with sharper focus and better definition, free from distortion and grain.

A new item of general interest in the sound reproduction field is the replacement penthouse 4-track repro-

(*Continued on page* 28)

RE-ELECTED IA OFFICIALS

International President
RICHARD F. WALSH

General Secretary-Treasurer
HARLAND HOLMDEN

1st Vice-President
JAMES J. BRENNAN
(Ramsey, N. J.)

2nd Vice-President
CARL G. COOPER
(Los Angeles, Calif.)

3rd Vice-President
HARRY J. ABBOTT
(Philadelphia, Penna.)

4th Vice-President
ORIN M. JACOBSON
(Tacoma, Wash.)

5th Vice-President
HUGH J. SEDGWICK
(Hamilton, Ont.)

6th Vice-President
ALBERT S. JOHNSTONE
(New Orleans, La.)

7th Vice-President
WILLIAM DONNELLY
(Minneapolis, Minn.)

8th Vice-President
JOHN A. SHUFF
(Akron, Ohio)

9th Vice-President
MISS LOUISE WRIGHT
(Dallas, Texas)

Trustees
WILLIAM C. SCANLAN
(Lynn, Mass.)

R. E. MORRIS
(Mobile, Ala.)

GEORGE W. BRAYFIELD
(Denver, Colo.)

In The SPOTLIGHT

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

ALTHOUGH projectionists earnings were not involved, a recent plea by Minnesota exhibitors against an increase in the State minimum wage law is most worthy of notice in these columns. Despite spiraling living costs, these hard-shell exhibitors protested a proposed State minimum wage of $1 per hour. The argument's presented against the proposal give a clear indication of the problems projectionists would be faced with if they had to deal with exhibitor groups without the backing of a strong union.

Hearings on the proposed increase in the minimum wage law have been held before the Minnesota State Industrial Commission following the recommendation of an advisory group in favor of a $1 per hour minimum wage. In their protests before the Commission, the exhibitors claimed that such an increase would "work a financial hardship" on them, and they also questioned the right of many of their employes to a living wage.

Pleading financial hardship, it seems to us, should be the plea of the underpaid workers whose living standards need to be improved to the bare $1 per hour that Minnesota deems necessary for existence. But without batting an eyelash, the exhibitor groups embroidered the irony of the situation by usurping the plea of poverty from the poor.

Many theatres in the state of Minnesota pay theatre employes—such as ushers and cashiers—50 to 60 cents per hour. It is the contention of the exhibitors that these groups of employes—ushers and cashiers, in particular—are part-time workers supplementing their income with such pin-money as they can acquire. The average theatre employee, they claim, is very often a high-school student, living at home, whose earnings therefore should be considered as a supplement to his or her allowance.

The advisory group to the Commission described the needs of a "model" or average employe, and the proposed minimum of $1 per hour was based on these needs. Such a person would be a hypothetical single woman living alone in a rented room, eating three meals a day and entirely dependent on the income from her job. "But," said S. D. Kane, counsel for the exhibitors, "no such woman exists. Employes are the high-school student type."

The contention—that labor value changes because of the private circumstances of the worker—is a kind of economic fable which many employers would like to believe.

Applying the yardstick that people who work for movie houses are really just kids picking up pin money, it is not too difficult to imagine similar exploitative tactics harassing the men in the projection rooms. They, too, might be expected to be grateful for crumbs were it not for union safeguards to the dignity and worth of their labor.

As a result of these hearings, the Commission has given the exhibitors and their lawyers 30 days to submit briefs before making a decision. The matter will then be taken under advisement.

• The New York State Association of Motion Picture Projectionists will hold its 1956 Fall meeting on Monday, October first, at the Red Coach Inn, Niagara Falls, N. Y. Among the important bits of business slated for this meeting is the election of officers for the next two years.

• Two more houses in the Baltimore area—Bengies Drive-In and the 5 West Theatre—have signed up with Projectionists Local 181.

• Because of a decrease of business in four of its borderline houses, Odeon Theatres of Canada has advised Vancouver Local 348 that it is willing to lease the theatres to projectionists who probably could operate them more economically. These theatres, all under 500 seats, are located in the Fraser Valley area within 40 miles of Vancouver.

• Detroit Local 199 has moved its headquarters to the new labor union center—the Metalworkers Building at 2998 East Grand Blvd.

• Representatives from various IA Locals in the New York City area have expressed concern about the status of the Warner News, Inc. employes when the new management takes over this Warner Bros. subsidiary. For the past several weeks union officials have discussed with Norman H. Moray, president of Warner News, the matter of severance pay for those employes who may lose their jobs as a result of the change of

DELEGATES AT RECENT 32ND TRI-STATE ASSOCIATION MEET



Seated, left to right: James V. Sipe, Association secretary; H. I. Abbott, IA 3rd vice-president; Lawrence Katz, IA representative; P. Bordonaro, 4th District secretary. Shown standing in rear are officials of DuBois Local 703: William J. Walker, secretary; Raymond McGreevy, member, executive board; C. Fleming, business representative; and Joseph Beezer, president.

management. The IA Locals are not only interested in this particular situation but have expressed deep concern over reports reaching them of the possibility that Warner Bros. may divest itself of other subsidiaries employing union labor.

• Charles H. Thonson of Pittsburgh 34, Penna., has developed a new method of regrinding standard 35-mm sprockets on their respective intermittent movements for use for CinemaScope and magnetic-optical prints. He claims that the process is applicable to intermittent movements of the following projectors: Simplex Standard (with or without rear shutter), Simplex Super, Simplex E-7, Century C and CC, Motiograph Model K (and earlier models), and the DeVry 12000. For further details, contact Thonson at 3124 Homehurst Avenue.

• The high regard in which the projectionist craft is held by National Carbon Company was very clearly demonstrated at the recent IATSE convention in Kansas City, where "open house" was the watchword at NCC's headquarters at the Muehlebach Hotel. Bill Kunzmann, former sales representative for National and now retired, was called upon to manage the setup and handled it in his usual expert fashion. Among the top NCC carbon personnel in evidence at the headquarters were J. R. Johnstone, Charles Handley, J. C. Naughton, and Fred Stovenour, who did their share in making it the most popular meeting place during the convention week.

• In response to frequent requests for current information about State laws permitting employes to take time off to vote during working hours, the Bureau of Labor Standards (U. S. Dept. of Labor) has prepared a pamphlet, "Time Off for Voting Under State Laws," Bulletin No. 138, 1956 revision, which gives a comprehensive summary of the provisions relating to the subject.

• IA Local 453, Willimantic, Conn., was upheld by the Connecticut Board of Labor Relations in its charge of unfair labor practice brought against the E. L. Realty Co., which operates the Lord Indoor-Outdoor Theatre in Plainfield, Conn. Edward Lord, president of E. L. Realty, was charged with having arbitrarily dismissed the projectionist at the theatre, Frank Fluegel, for union activities. Although the exhibitor claimed that he dismissed Fluegel because of alleged damage to certain films shown at the theatre, the Board concluded as follows:

"We find in the light of all the evidence and the reasonable inference that may be drawn therefrom that the Respondent seized upon the damage to the 'Tender Trap' and 'Feudin' Fools' films as a pretext for the discharge of Fluegel but that the true and motivating cause was his union membership and activity."

The exhibitor was ordered to reinstate Frank Fluegel to his former job and make up any loss of pay suffered by reason of his discharge on December 3, 1955 up until the time he is reemployed.

PERSONALITIES AT RECENT IA KANSAS CITY CONVENTION



When good fellows get together: (left to right): Orin M. Jacobson, 4th vice-pres.; President Richard F. Walsh; Harry Truman; Harland Holmden, IA General sec.-treas.



President Walsh hands gavel to M. B. McMahon, delegate from Local 317, Waukegan, Ill., winner in "President's Raffle." IA Representative Steve B. Newman (left) handled the drawing for the gavel.

AT THE IA CONVENTION



AFL-CIO President George M. Meany in a huddle with IA President Richard F. Walsh.



COPE treasure chest inspected by George Barrett, Kansas City Local 170 business representative, and IA Representatives Richard Scott and John N. Spearing.

• The listings appearing in IP from time to time of the fabulous collection of projection memorabilia amassed by Ray Brian, member of Local 434, Peoria, Ill., have aroused considerable interest in the industry. Making up an important segment of this record is an extensive collection of photographs of many of the oldest models of projectors. Brian has arranged with LaVezzi Machine Works to display a selected number of these photographs in their Booth No. 34 at the TESMA Show, beginning September 20 at the Coliseum in New York City.

• "Films for Labor," a 71-page catalogue recently issued by the AFL-CIO Department of Education, describes the 16-mm sound films now available from its Film Division. The catalogue lists approximately 200 titles covering a variety of subjects from grievance procedure to world affairs. Single copies may be obtained without charge from the AFL-CIO Department of Education, 815 Sixteenth St., N. W., Washington, D. C.

• Lou Brazda, member of Denver Local 230, boasts of 32 years as a motion picture projectionist. Twenty of these years

(*Continued on page* 27)

Technician's Viewpoint . . .

A monthly department that explores new ideas and current problems affecting projectionists.

AS A CLASS, projectionists are undoubtedly sensitive to music and sound quality. A sour note in a musical performance sends us to the aspirin bottle. We can therefore readily understand the torment of the projectionist who gets stuck wih a lousy non-sync—the same thing has happened to us in many theatres.

"Our non-sync sounds terrible," writes a soul-mate. "New needles in the crystal pickup don't help. The sound is shrill and scratchy."

The new reluctance pickups (a modern version of the old magnetic type) are much superior to crystal pickups, but their impedance is lower, requiring a matching transformer, and their output is considerably less, requiring an extra stage of amplification (furnished by a special preamplifier). Crystal pickups are capable of giving good results when properly balanced electrically, however; and their chief disadvantage is their fragility and consequent short life.

Whether made for 78 RPM or 33⅓ RPM or 45 RPM records, crystal pickups utilizing Rochelle salt crystals are particularly sensitive to heat, moisture, and rough handling. Temperatures much above 100 degrees Fahrenheit destroy them. A prolonged spell of damp weather may make them unfit for use. Rough handling when changing needles may fracture the little crystal slab.

But they were formerly very popular because they are so light in weight, low in price, and high in output (about 1½ volts for an overall groove amplitude of 0.85 mil at 1,000 cycles). Moreover, their high internal impedance (about equal to 800 micromicrofarads) makes their hookup to the low-gain audio amplifiers used in cheap radio sets very simple.

Unfortunately, output decreases, with a marked loss in the low-frequency range, as ambient temperature increases. And unless very carefully manufactured, clicks and raspy noises may be generated by needle swing in its normal amplitude range. This makes the sound "mushy" and intolerable to projectionists and other musically sensitive persons.

Well, let's see, kindred spirit, what we can do to help you. If your crystal cartridge is in good condition (fairly new and not mistreated), the "shrill and scratchy" sound is due to impedance mismatch. The pickup "hot lead" should be connected directly either to one leg of a volume-control potentiometer or directly to the grid of the vacuum tube. The other lead goes to the ground of the amplifier (see Fig. 1).

By shunting a resistor between the pickup leads, a treble-cut is obtained which actually amounts to a boost of the bass frequency if you are using enough amplification. The value of this resistor should be from 1 to 5 megohms, depending upon the amount of bass boost required. (A 5-megohm resistor will correct the scratchy shrillness and give you a pleasingly mellow tone with loud low-frequency response.)

Now, all motion-picture amplifiers already have this "terminal resistance" in the grid circuit of the second voltage-gain tube, which is the one connected to the phono jack. If, however, the high-frequency response is still too strong, making the sound shrill and scratchy, all you have to do is insert a resistor in the "hot lead" of the pickup (that is, connect a resistor in series with the pickup). This resistor may also have any value from 1 to 5 megohms.

If you do this, and the resistor doesn't improve the sound, it means that a condenser is in series with the pickup *inside the amplifier*. You can do either of two things. (1) Connect the resister in parallel with the pickup to see if the sound is improved (not likely) or (2) get inside the amplifier and change the phono-jack wiring so that one wire goes directly to the grid of the tube and the other to the ground (the better expedient).

If you have, or can get, a separate preamplifier for your crystal pickup, you are indeed a lucky guy! The preamplifier will give you enough extra power to use a tone-control "pad," or "network" (which you can make yourself) between the preamplifier and the theatre amplifier phono input. In other words: pickup to preamplifier to pad to theatre amplifier.

Figure 2 shows a simple bass-boost pad which will give you pleasingly "boomy" bass tones and kill much of the shrillness of the trebles and the scratch of the needle. Experiment with the capacitor, and use a value that gives you just the response you like.

Want something fancier? Something that will get the admiration of hi-fi fans? Well, then, take a look at Fig. 3. It's a honey of a versatile tone-control pad employing two separate potentiometers, one for adjusting the treble response and the other for regulating the bass response.

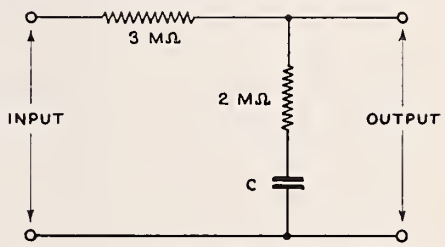


FIG. 2. Bass-boost tone-control "pad" or network.

The exact values of the resistors and capacitors can't be given, for they will depend to a great extent upon the impedance of the preamp output and that of the theatre amplifier input. In general, the resistors may range from 10,000 ohms to 1 megohm (1,000,000 ohms)—this is not too important. As for the condensers, some experimentation is needed. Try different values from 0.001 microfarad to 1 mf.

HERE'S a familiar complaint that adds up to the old generator-*versus*-rectifier controversy. A projectionist in a drive-in theatre is troubled by flicker—the kind of flicker which becomes very

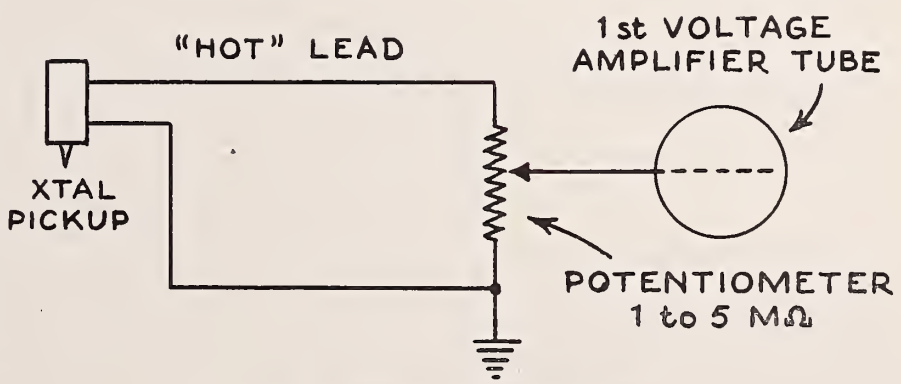


FIG. 1. Elementary crystal-pickup circuit

noticeable in high-key scenes and in areas of bright clouds, white buildings, snow, etc. It seems that the management recently replaced the old generators of inadequate current capacity with new selenium rectifiers.

"Isn't 6-phase rectification supposed to prevent flicker?" asked our worried friend. We replied:

"Neither 6-phase nor even 12-phase rectification will prevent flicker when the three separate voltages supplied by the 3-phase power mains vary by more than 4 or 5 per cent."

The input voltages supplied by the 3-phase mains were tested. Phase #1 was 220 volts, phase #2 was 245 volts (a difference of nearly 10 per cent), and phase #3 was 200 volts (a difference of nearly 10 per cent with phase #1, 18 per cent with phase #2).

No matter how many phases the 3-phase input has been split up into by the recifier transformer, *it is always true* that phase voltage differences result in 60-cycle ripple. A ripple of this frequency generates a number of flicker frequencies, due to interaction with the 48-cycle shutter frequency; and the 12-cycle "beat" is the worst offender.

From the point of view of the projectionist using rectifiers for his arc current, it is a misfortune that private power companies, however punctilious they may be in the matter of paying dividends to their stockholders, are notoriously lax when it comes to service. The three legs of 3-phase lines are often grossly unbalanced because of poor circuit planning and antiquated hookups. Line transformers are frequently inadequate, and large motors on one leg and streetlights on another lower the power factor and disturb effective voltage.

The writer resides in a region where water power is abundant, yet electric service is poor and power rates are the highest, not only in the United States, but in the world. In this region the wise theatre owner installs motor-generator sets, not rectifiers, for flicker-free pictures.

Our projectionist friend should equalize voltage differences as nearly as possible on the transformer input (primary) taps of his new selenium rectifiers. Of course, differences in the aging characteristics of the selenium units could also produce flicker, *but his rectifiers are brand new!*

A SOMEWHAT similar request for information came in the mail. A projectionist is using 3-phase *tube-type* rectifiers in an indoor theatre. Flicker and tube burnouts are the complaints. Here again the separate voltages of the 3-phase input should be checked; but the trouble causing the flicker could also reside in slightly different outputs from the six tubes (two for each phase). This is a matter which should be checked *after* the 3-phase voltages have been measured and equalized insofar as is possible on the three sets of input taps. Differences in tube output currents should be equalized by changing tubes until flicker is reduced to a minimum. (The task is simplified when a tube-tester is available for testing the plate currents of Tungar tubes.)

Tube burnouts in this type of rectifier are usually caused by an incorrect method of switching. Instead of leaving both rectifiers on all the time, and turning the power on and off at the arc-lamp table switch as is done with a generator, a relay switch should be used to turn each rectifier on and off on the input, or AC, side. In this way sudden breaking of the secondary, or output, circuit will be avoided, for it is this that develops transient surges strong enough to blow the tubes. All manufacturers of tube-type rectifiers are in agreement on this point, and will be glad to furnish the necessary information for hooking up the correct switching arrangement.

By and large, motor-generator sets are best for flicker-free projection. True, generators are less efficient than rectifiers, but they are less troublesome and provide the smooth, steady current needed by projection arc lamps. Slight voltage differences in the 3-phase input current that drives the motor make no difference whatever to motor-generator sets. There is no 60-cycle ripple in their output current. Above all, the momentum of the revolving armatures effectively smooths out the sudden minor voltage fluctuations of the line current. Rectifiers transmit these to the arcs.

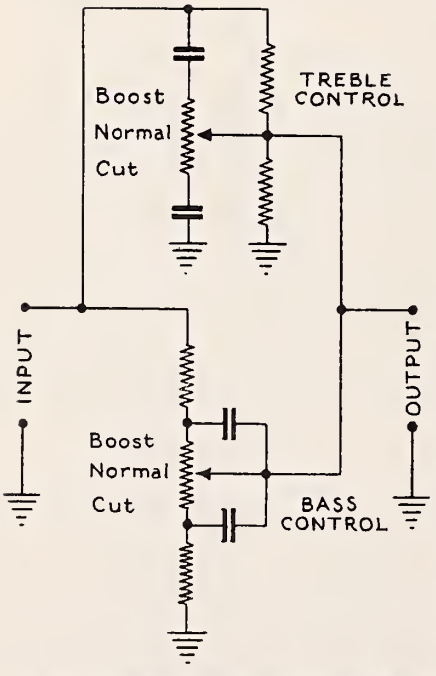


FIG. 3. A versatile tone-control circuit having two potentiometers, one for regulating the volume of the treble frequencies and the other for adjusting the volume of the bass frequencies. This hi-fi "pad" should be inserted between the preamplifier for the phonograph pickup and the phono input of the theatre sound-system amplifier.

16-mm Field Awaits Xenon Lamp, Cronar

A number of exciting new developments relating to 16-mm projection were discussed and exhibited at the 11th annual National Audio-Visual Convention held recently in Chicago. Among the many topics dealt with, projectionists will find most interesting the data pertaining to Xenon gas, transistors, Cronar and Mylar plastic, and Polaroid "instant" slides.

Xenon gas. It was revealed at the convention that the Xenon gas lamp, a light source now being used by the Navy for 16-mm projection, will soon change the design of many 16-mm projectors. Packaged in lightweight portable lamphouses, the Xenon tube is said to make possible a greatly increased light output. A 16-mm projector now produces about 375 lumens with a tungsten light source. Reports are that the Xenon tube can supply 1,800. Increased lumen output of 16-mm projectors would be an important step in solving the major problem of light control that has for a long time plagued users of educational films and other projected material.

Transistors. Referred to as the "midget miracle" of the electronic world, the transistor also will contribute to new designs. Smaller and more sturdy sound amplifiers may be produced with transistors, an industry spokesman declared, in comparison to the large, delicate units widely used in portable motion picture projectors today.

Cronar and Mylar plastic. These developments are already being applied to the manufacture of magnetic tape. Extremely satisfactory results have been reported by a number of users. The new processes produce tough, durable film bases which are expected to eliminate a large amount of the film damage caused by scratches and torn sprocket holes.

Polaroid "instant" slides. The Polaroid positive film process received its world premiere demonstration at the NAVA trade show. While keynote speaker Charles F. Appel was describing the merits of the Polaroid process, several pictures of the audience were taken with the new film, using only available light. Inside of two minutes, fully developed slides were projected for all to see.

M-G-M Enters TV Field

The recent action of M-G-M in entering the TV field was the most decisive jump on the TV bandwagon taken so far by any Hollywood producing company. Not only will the studio sell its vast film library for fall programming, but it will sell the films through a special M-G-M sales organization set up to service all TV stations.

Other studios usually sold their old films to TV through an outside middleman who paid a flat price for a library and then resold the movies to TV networks and independent stations. M-G-M is said to have rejected a $50,000,000 offer for just such a deal.

In addition to selling its old films, the studio will shortly begin producing new films especially for TV. It also is considering the establishment of a TV film network as a regular outlet for its products and for obtaining a complete or partial interest in some TV stations. Entry of M-G-M into the TV field is not expected to result in any curtailment of the studio's services to theatres, but rather an overall expansion of its activities.

All M-G-M pictures produced from the advent of sound until 1949, including nearly 1,000 feature films and about 900 short subjects, will be available to TV. A catalogue of the huge backlog of films will soon be issued to TV stations throughout the country.

Pictures available for telecasting will include: "The Yearling," "Easter Parade," "Mrs. Miniver," "Random Harvest," "Gaslight," "The Great Ziegfeld," "Boys' Town," "Goodbye Mr. Chips," "Mutiny on the Bounty," "Meet Me In St. Louis," "A Tale of Two Cities," "San Francisco," and "David Copperfield." Only one pre-1949 picture is being withheld from TV release—this is "Gone With the Wind."

National Carbon Expansion

More than doubling previous expansion plans, National Carbon Co., a division of Union Carbide and Carbon Corp., will increase its annual production capacity of carbon and graphite electrode products by more than 100 million pounds.

Included in the expansion will be both new construction and revamping of existing facilities at plants in Columbia, Tenn.; Clarksburg, W. Va.; and three plants at Niagara Falls, N. Y. Products of these plants include carbon, coke and graphite materials in the form of electrodes for electric furnaces in the steel and chemical industries, anodes for chemical producing cells, carbon refractories for furnace linings as well as projection carbons.



. . . the SUPER SNAPLITE LENS for the clearest, sharpest, brightest pictures you have ever seen on your screen!

Your patrons will notice the difference — Super Snaplite gives greater contrast, better definition, more light on the screen where it really counts.

Ask your dealer for Bulletin 222.

KOLLMORGEN Optical CORPORATION
NORTHAMPTON, MASSACHUSETTS

Movies Add a Billion to National Income in '55

The motion picture industry accounted for $1,003,000,000 of the national income in 1955, compared to $612,000,000 provided by radio and television broadcasting. All other amusements added $1,080,000,000 more to bring the grand total for all the entertainment fields to $2,695,000,000, according to a recent report issued by the Department of Commerce.

Further statistics show that the film industry paid $754,000,000 in wages and salaries last year, to top the $456,000,000 paid out in the area of radio and TV broadcasting. All other amusements and recreation activities had a total payroll of $804,000,000. However, the average full-time employe in broadcasting in 1955 earned $6,333 as against $3,678 earned by the average full-time worker in the motion picture industry.

The report also stated that the equivalent of 205,000 full-time jobs were provided by all branches of motion pictures for 228,000 men and women, while radio and TV broadcasting supplied the equivalent of 72,000 jobs to 79,000 individuals. All other amusement and recreation activities combined provided about 238,000 full-time positions.

The year 1955 saw an increase in the annual contribution of the motion picture industry to the national income. Meanwhile, broadcasting's contribution reached an all-time high for that field.

Closed-Circuit TV Boom

New uses for closed-circuit TV will build it into an industry rivaling regular broadcast TV within ten years, according to a recent survey of manufacturers in the field. The survey disclosed industry-wide opinion to the effect that the annual dollar volume of closed circuit TV will reach near $6,000,000 in 1956 and then jump as much as fivefold during the next few years.

Anticipating the increased use of closed circuit, manufacturers are now concentrating on developing complete self-contained systems designed for superior performance. Sales of these closed circuit package units are climbing steadily. It is expected further that closed circuit color TV will begin to hit its stride in a few short years.

The optimistic attitude of the closed circuiteers is based largely on the new uses constantly being discovered for this medium. Department stores all over the country are now using one type of closed circuit TV to display merchandise to the public and another type to pick out shoplifters. Closed circuit is also being used for training psychiatrists (see May *IP*, page 22), as well as for other educational purposes in a number of universities.

In the field of finance, banks have found closed circuit TV highly functional and have made large purchases of equipment. Power plants have installed closed circuit for close constant observation of various gauges and flame burners. Hotel chains now offer closed circuit TV as a special attraction to guests. Finally, many large industrial companies like U. S. Steel and General Motors have purchased closed circuit units on a purely experimental basis.

IA ELECTION

LOCAL 151, LINCOLN, NEBR.

S. R. Warner, *pres.*; H. C. McMullen, *vice-pres.*; M. F. Dewey, *fin.-sec.*; H. H. Hotchkiss, *rec.-sec.*; Earl Wise, *bus. rep.*

New Genarco Spotlight

A powerful new spotlight for theatrical use, now in production at Genarco, Inc., is being featured by the firm at the current TESMA equipment show in New York City. The spotlight, which is claimed to be capable of producing as much as 14,000 lumens, is built around a carbon-arc system developed by Genarco for the United States government.

Known as the Model AC-3, the spotlight is powered by alternating current. Is is unusual in design in that the light from both carbons is utilized. A blower system is said to renew the atmosphere inside the lamp every two seconds.

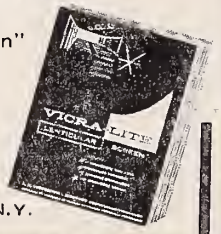
The operation of the arc is claimed to be entirely automatic and self-focusing. It is maintained exactly at the focal point of the 16-inch reflector, according to the manufacturer, so that the projectionist is free to devote his attention to aiming the spot. Additional information about the AC-3 Spotlight can be obtained from Genarco, Inc., 97-04 Sutphin Blvd., Jamaica, N. Y.

See how its done
Booth 61
TESMA

You can't make the pic better . . . but you can make it click better

How? Squeeze more of the entertainment value — for more of your patrons — out of every product you show. Give the *side*-seat patrons a break — don't let your "half-there" screen rob them of half the emotion. Fill more seats. Find out fast about the

VICRA-LITE
LENTICULAR SCREEN
"the screen of optical precision"



See your theatre supply dealer; write today for factual booklet, containing sample swatch.

L. E. CARPENTER & COMPANY
VICRA-LITE SCREEN DIVISION • Empire State Building, New York 1, N.Y.

Fabulous New Film Cement

It was announced that a revolutionary new type of film cement for all 16- and 35-mm film has been developed by a leading laboratory. The ability of this cement to prevent splices from pulling apart and peeling far surpasses anything previously tested. A limited amount has been released for consumer use exclusively to

FLORMAN & BABB
Movie Equipment Distributor
68 West 45 St., New York, N. Y.

Prices quoted for F&B cement: 1 oz., 40c; ½ pt., $1.50; pt., $2.50. Free sample of F&B #55 sent on request

OBITUARIES

PATTERSON, HERMAN F., 63, member of Local 228 Toledo, Ohio, died last month at St. Lukes Hospital there. Born in Monticello, Ill., Herman Patterson came to Toledo in 1916, and joined Local 228. He worked in the projection rooms of the Princess, Rivoli, and Loew's Valentine Theatres. Survivors are two daughters, two sons, and three grandchildren.

• • •

KENNEDY, MATTHEW, former president and business representative for Local 273, New Haven, Conn., died recently after a long illness. Because of ill health, he left his job at the Paramount Theatre early this year, where he had been employed for ten years. He is survived by his wife, two brothers, and two sisters.

• • •

MABEUS, FREDERIC H., 45, member of Local 324, Albany, N. Y., died suddenly. He worked as projectionist at the Delaware Theatre in Albany and also operated a television repair service. His wife, a son, and a brother survive.

• • •

BALDY, GEORGE, 72, member of Local 348, Vancouver, B. C., died last month. A projectionist at the International-Cinema there for many years, he retired some time ago because of ill health.

• • •

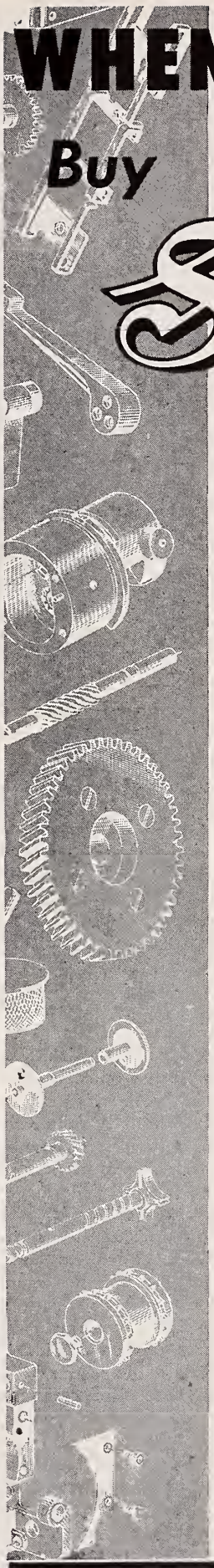
SIMKO, GEORGE, 52, member of Cleveland Local 160, and projectionist at the Lorraine Theatre, died August 30 from a heart attack suffered several weeks previously. He is survived by his wife, father, and a brother.

• • •

SLENKER, FRED O., 62, charter member of Local 433, Davenport, Ia., and Rock Island and Moline, Ill., died recently following surgery. He was the Local's first recording-secretary and also served several terms as a member of the executive board. He was a projectionist at the Tri-States and Bel-Air Drive-In Theatres in Davenport.

George F. Sandore Dies

George F. Sandore, sales manager of the technical products service department of the RCA Service Co., died suddenly at the age of 54. A member of the RCA 25-year club, he had been with the company since 1929, beginning as a service engineer. For a while he supervised the installation of motion picture equipment in Mexico, Cuba, and Puerto Rico, then in 1940 was named RCA district service manager in Kansas City. He joined the RCA Service Co. at Camden, N. J., in 1943 and held his last position for five years. He is survived by his widow, Mrs. Eva Hogan Sandore.



WHEN YOU BUY...

Buy Simplex

T.M. REG. U. S. PAT. OFF.

Your SIMPLEX Projector Mechanism represents a priceless investment. You bought it after long, careful study because you recognized it as the finest projector on the market.

Don't take chances with such an investment — *the very success of your theatre* depends upon its performance! When spare parts are necessary, insist on the best — insist on *SIMPLEX* parts!

From the smallest stud pin to the largest gear cover, every part is made with the same precision and skill as the mechanism itself. By using *only* SIMPLEX parts, you can be certain of maintaining the high quality of performance that has made SIMPLEX the world's foremost projector mechanism!

Genuine SIMPLEX parts are available only through

N.T.S

Your Guarantee

of Consistent Quality and Outstanding Service

NATIONAL THEATRE SUPPLY • 29 BRANCHES COAST-TO-COAST

Ray Brian's Movieana Archives

WE RECEIVED a note recently from Ray Brian, of Peoria Local 434 in which he asked to express his personal thanks to those readers who have sent in additional material for his "Movieana Archives," a unique collection of projection equipment data. Over the years, Brian has collected voluminous files of information and pictures on motion picture projectors dating back as far as the 1890's and manufactured in all parts of the world.

His list of projectors and their manufacturers, which is probably the most complete in existence, is being published serially in IP. Following is the 11th installment of the series. Except where an item is marked with an asterisk, Brian has pictures as well as information about the projector concerned.

U. S.—U. S. Cinematograph Co., Chicago, Ill.*

UNISCOPE—Burke and James, Chicago, Ill., 1922.

UNIVERSE—made in England by Kamm, 1910.

UNIVERSAL—

UNIVERSEL—Appareils Sonores, Paris, France.

VANOSCOPE—Lewis C. Van Riper, 1911.*

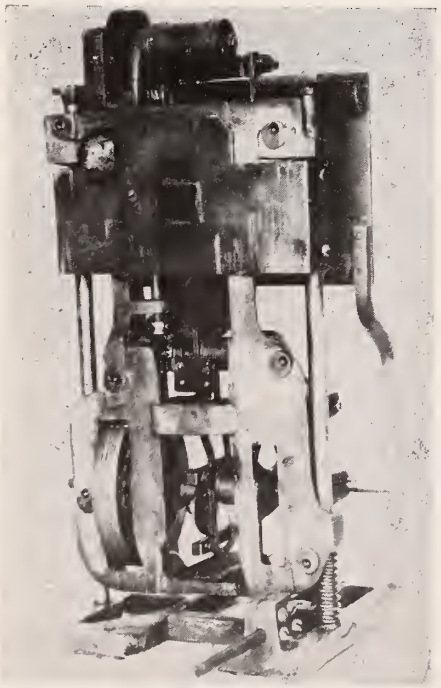
VARISCOPE—made about 1900.*

VELOGRAPH—made in England, 1898, English patent #17049.*

VENETROPE—made about 1900.*

VERISCOPE—Enoch J. Rector, 1897, 63-mm.

VERISCOPE—Wilboken Mfg. Co., Milwaukee, Wis., 1913.



"Viascope" (with claw movement) built by John J. Pink, Chicago, 1908.

VIASCOPE—John J. Pink, Chicago, Ill., 1906.

VIEOGRAPH—made in 1898.*

VIG—Gummax Nilsen, 1926.

VICTOR—Alexander Victor, Davenport, Ia., 1917

VICTOR—made in England.

VITAE—Eberhart Schneider, 1908, used a mirror shutter.

VIM—Color projector built by Victor Duhem, 1911.*

VINASCOPE—*

VIROSCOPE—made about 1900.*

VISIONOSCOPE—made about 1900.*

VERTESCOPE—made about 1900.*

VITAGRAPH—Albert A. Smith, 1899, Edison design.

VITAGRAPH — Clement and Gilmer, 1900*.

VITAMOTOGRAPH—1900.*

VITALETISCOPE—1900.*

VITROSCOPE—*

VITASCOPE — Thomas Armat, 1896, marketed by Edison.

VITASCOPE—made in Germany by Duetsche, 1904.

VITAX—Enoch J. Rector, 17.5-mm.*

VITALUX—John Frueler, 1924.*

VITAPHOTOSCOPE—made in England by Philip Wolff, 1897.

Form East-Coast Committee On Projection Problems

A solution to the problem created by distribution of prints that are excessively dark for wide-screen projection, and particularly for projection at drive-in theatres, is being sought by the recently organized East-Coast Committee on Projection and Sound of the Motion Picture Research Council.

The committee is composed of theatre circuit and studio projection experts who make their headquarters in New York City, and is chaired by Frank Cahill, of Warner Brothers. Other members include: Harry Rubin, of American Broadcasting—Paramount Theatres; John Kohler, of Loew's, Inc.; Charles Horstman, RKO Theatres; Gio Gagliardi, Stanley Warner Theatres, and Joe Florio, of Warner Brothers.

In discussing the print-density situation, the East Coast Committee came to the conclusion that many studios would change their estimates of how dark a print could be if they previewed pictures in screening rooms that duplicated conditions as they exist in theatres.

Generally, studio executives examine their product in small screening rooms where screens are also small. These screens can be so brightly lighted that the subtle effects created by dense, low-key prints are easily appreciated. On the other hand, in theatres with very large screens and at drive-ins these same subtle effects are most often lost.

The East Coast Committee plans to hold regular meetings during the fall and winter and to cooperate closely with the Research Council in Hollywood in dealing with such problems as excessively dark prints and finding ways to reduce buckling and flutter of the film under great heat.

Expect Record Attendance At TOA-TESMA Show

Advance registration figures, which have been running 40% ahead of last year, indicate a record attendance for the combined convention of TOA and TESMA (Theatre Owners of America and the Theatre Equipment and Supply Manufacturers Association) being held at the New York Coliseum, New York City, Sept. 20 to 24. An elaborate equipment trade show running concurrently with the convention will include displays of the latest projection and sound equipment produced by American manufacturers and also much equipment manufactured overseas.

A feature event of the convention is the annual Equipment Showmanship Forum which is sponsored by TESMA. This is being held on Saturday morning, September 22, on the fourth floor of the Coliseum. The forum is composed of a large group of engineers and theatre equipment experts who will discuss current problems in wide-screen projection. Also considered will be the use of 65- and 70-mm prints for special road-show presentations. The forum is expected to attract a large audience of projectionists and theatre technicians as well as exhibitors.

Plan CBS Television City

If tentative plans for expansion by CBS and NBC television are put into effect, it would mean that New York City could probably entrench itself permanently as the leading TV center in the world. Both of the major TV networks have large projects now in the paper stage. Execution of the plans would undoubtedly mean more opportunities for projectionists in the metropolitan area.

The proposed 5-block long CBS Television City is currently undergoing negotiations between William S. Paley and Frank Stanton, both of CBS, and the well-known realtor, William Zeckendorf. Blueprints for the project call for a community of buildings even larger than Columbia's TV City on the west coast. CBS-TV is striving for occupancy by 1959. NBC, on the other hand, seems about ready to go ahead with a block square project right in the center of New York to be built by certain Rockefeller interests.

IN THE SPOTLIGHT

(*Continued from page* 20)

were spent in the service of Fox Denver Theatres. He is presently working at the Aladdin Theatre where the great film classic "Fantasia" was recently shown.

Brazda found the showing of the current version of "Fantasia" a challenge which he enjoyed tackling. "Before we could show the picture to the public," he recently stated, "we had dry runs for a week, working mornings before the theatre opened, and after midnight when it had closed. For a while three sound technicians and four projectionists worked together on the practice runs." To Lou Brazda and Ray Wynn, his co-worker at the Aladdin, both rated high in projection circles, technical problems present a challenge to be met head on and overcome.

• The 21st Rochester International Salon of Photography will open at the Memorial Art Gallery in Rochester, N. Y. on March 1, 1957. Data and entry forms will be available after October first of this year from Thomas F. Murray, 301 Ridgeway Ave., Rochester 13, N. Y.

• Approximately 40 members of Detroit Local 199 were recently engaged by the Wilding Productions and Jam Handy Organization to handle special road shows. The tours averaged two to three weeks and ran on a staggered basis between September 1 and 10. The road shows consisted of commercial films that were shown in advance of new car models for the various automobile manufacturers, and were presented in selected cities across the country to groups within the manufacturers' own organizations.

Loans for Theatre Equipment

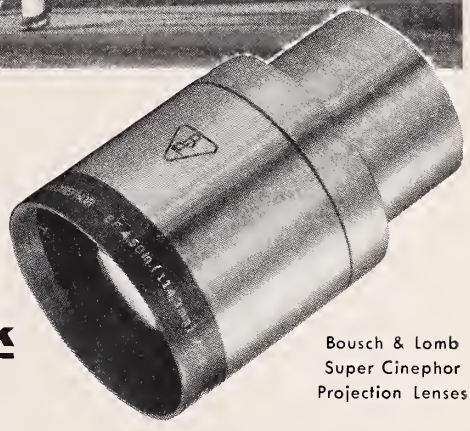
President Myron Blank of the Theatre Owners of America has appointed a special committee, headed by vice-president A. Julian Brylawski, to urge adoption of the recent Senate Small Business Committee's recommendation that government funds be made available for rehabilitation of theatre properties and equipment. Brylawski is expected to make a report on the progress of his committee at the forthcoming TESMA-TOA convention in New York City.

In creating the new committee, Blank declared, "It is the desire of our organization to take full advantage of the prospective government help and financing which has been so difficult for the small theatre owners and individual operators to obtain." He added that the prospect of obtaining such funds will undoubtedly stir up greater interest in the forthcoming trade show.



Scene from "Bus Stop," 20th Century-Fox CinemoScope Production

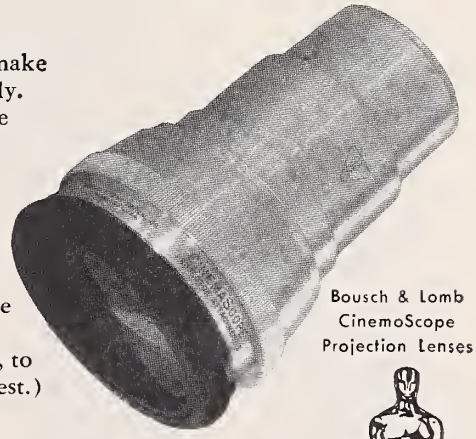
Bring 'em in with Marilyn... Bring 'em back with the



Bousch & Lomb Super Cinephor Projection Lenses

PERFECT-PICTURE PAIR

After Marilyn's enticed them in, make them want to come *back* regularly. Count on the B&L Perfect-Picture Pair for the clearest, brightest images, distortion-free over the entire screen area. Complete line for all projectors . . . for theatres and drive-ins . . . for Wide Screen, CinemaScope, SuperScope. (All the CinemaScope 55 road shows used the B&L Perfect-Picture Pair . . . obviously, to show the great new films at their best.)



Bousch & Lomb CinemoScope Projection Lenses

SEE THE BIG DIFFERENCE . . . FREE DEMONSTRATION

Write today for demonstration, and for Catalogs E-123 and E-141. Bausch & Lomb Optical Co., 61609 St. Paul St., Rochester 2, N. Y. (In Canada, General Theatre Supply, Toronto.)

Academy of Motion Picture Arts and Sciences Honorary Award for Optical Service to the Industry

BAUSCH & LOMB

SINCE B&L 1853



© A.M.P.A.S.

SMPTE to Stress Theatre Projection

The advance program of the Fall convention of the Society of Motion Picture and Television Engineers indicates a reversal of the trend which was apparent at the Spring SMPTE meet in New York when the technological problems of the TV industry overshadowed technical dedevelopments in the field of theatrical motion pictures. The convention will run from Sunday, October 7 to October 12 at the Ambassador Hotel in Los Angeles.

Three sessions of the convention will be completely devoted to the motion picture industry. The afternoon session on Monday (8th) will be for the reading of papers of general interest to all technical people in motion pictures. An evening session on Monday will be devoted to improvements made by the Technicolor organization in methods of producing prints for wide-screen projection.

A session specifically devoted to new projection developments will be held on Wednesday morning. Papers are scheduled on the following subjects: new high-power projector carbons, reversed anamorphic lenses for CinemaScope projection, a combination 65/35-mm Simplex projector, and sharpness and contrast in projected motion pictures. The last paper is by Ralph M. Evans, of Eastman Kodak.

The remainder of the convention program will be devoted to the reading of papers and discussion on a variety of subjects, both inside and outside the motion picture field. These include: laboratory practice for the production of theatrical and TV films, sound recording, TV broadcasting equipment, military and industrial applications of high-speed photography and various applications of transistors. At the evening session of the convention on Tuesday, Dr. W. H. Pickering, of the California Institute of Technology, will speak on "Project Vanguard—The Earth Satellite."

Are You Moving?

If so, please notify us one month in advance. The Post Office does not forward magazines. To avoid delay, please cooperate by sending us both your *new* and *old* address.

CHAMBERLIN'S TALK

(*Contiued from page* 18)

ducer head as announced by National Theatre Supply and Altec. This new replacement magnetic head is unique in that at such time as it is worn out, it can be re-built at 50% of original cost, thereby naterially reducing long-range magnetic reproduction maintenance expenditure for the theatre.

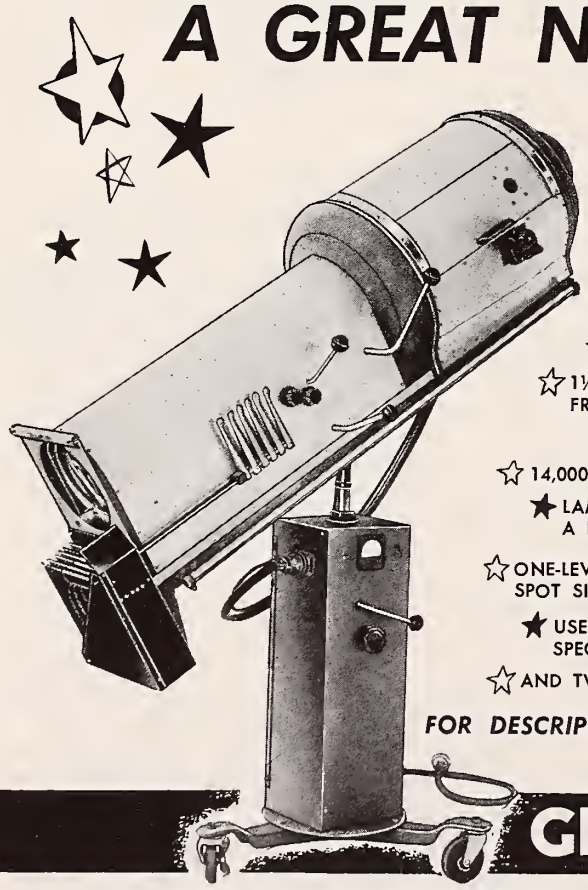
65/35-mm projector

I made a passing reference to 65-mm "Roadshow" prints. We realize that this would be impractical without 65-mm projectors. Our initial 65-mm projector was a Super Simplex converted in our own precision machine shop.

This conversion was engineered and followed through to a very successful completion by Brother Percy Marston of Local Union No. 789. Brother Marston is seated right over there as a delegate to this Convention.

Following the success of this conversion, we collaborated with the General Precision Laboratory in the conversion to 65-mm of two X-L projector

A GREAT NEW SPOTLIGHT



designed by GENARCO INC. is now in production with these outstanding features:

- ☆ NEW PRINCIPLE CARBON ARC LAMP. THE RESULT OF YEARS OF RESEARCH FOR THE U.S. GOVERNMENT GIVES TWO TIMES MORE LIGHT THAN CONVENTIONAL ARC LAMPS, BECAUSE IT USES THE LIGHT OF *BOTH* CARBONS.
- ★ COMPLETELY AUTOMATIC AND SELF FOCUSING ARC LAMP.
- ☆ 1½ HOURS OR 2 HOURS OPERATION WITHOUT RECARBONING, FROM A CONVENIENT 115 VOLTS AC OUTLET.
- ★ LARGE 16" DIAMETER REFLECTOR FOR HIGH LIGHT OUTPUT.
- ☆ 14,000 LUMENS TO FLOOD THE STAGE OR THE ARENA.
- ★ LAMPHOUSE, REFLECTOR AND MECHANISM KEPT COOL AND CLEAN BY A BLOWER.
- ☆ ONE-LEVER SPOT SIZE CONTROL WITH MAXIMUM LIGHT OUTPUT FOR EVERY SPOT SIZE.
- ★ USE OF *MIRACLE* MATERIALS: SILICONE BASE PRODUCTS, ULTRA INSULATORS, SPECIAL ALUMINUM ALLOYS, ETC. . . .
- ☆ AND TWELVE OTHER EXCLUSIVE FEATURES

FOR DESCRIPTIVE PAMPHLET ON THIS MODEL AC.3 SPOTLIGHT, WRITE

GENARCO INC. 97-04 B SUTPHIN BLVD. JAMAICA 35, N. Y.

Manufacturers of the METROLITE, the world's most powerful spotlight

heads. Following the shakedown running of the two X-L's, we again took advantage of Brother Marston and proceeded to convert these X-L's to dual purpose, 65-mm and 35-mm. Once again, we were successful. These two ambidextrous X-L's are installed and operating in our new 220-seat theatre on the M-G-M lot. To make the theatre more complete, we installed a G & G Specialties 60-ft. curved screen frame which is electrically adjustable to any curve from flat to 21%. This curve is remotely controlled from the booth. We feel that this new theatre, from the standpoint of being able to screen any existing process, is the most flexible yet installed anywhere.

We have definitely proven that conversion of present up-to-date projector mechanisms to reproduce either 35-mm or 65-mm film is not only possible but practical. So—roadshows, if the picture warrants such a release, are not just a figment of a publicity department's imagination. The use of full 65-mm positive prints in drive-ins will prove a tremendous projection improvement, should the drive-in exhibitors wish to explore that possibility.

Irksome Rep Tape

I agree wholeheartedly with the projectionist members of our Alliance when they seriously analyze what has become their cross to bear. In far too many situations, equipment purchases have been centralized to the point where the projectionist on the job has no idea of what is coming in or when he will receive it. Changes in equipment are made without consulting the member handling that equipment. As a result many of these expensive changes are totally unnecessary. Yet in cases where replacement parts are vitally necessary, it takes practically a board-of-directors' meeting to obtain them. Many individual exhibitors seem to be following a procedure of purchasing various gadgets and "new-look" requisites without any consultation with their projectionists.

We, as members of the Alliance, must also recognize the challenge to the exhibition industry that exists today, and we must do all within our power to put on the shows in the manner we know they should be presented. Let's put out what we bargained to give. Let's reach back through our years of experience and reassert the fact that we are the "neck of the bottle." We have conclusively proven through these past four years of technical turmoil that, if given half a break, we can handle anything they throw at us.

International President Walsh, our international officers and our I.A. Bulletin are always ready to assist us. The International Projectionist Magazine is another valuable tool available to us all. It is up to us, we know it, and let's prove to everyone else concerned that showmanship has never expired as far as the membership of our Alliance is concerned. Thank you very much.



When this man walks into your theatre...

...your service worries are over. In thousands of theatres throughout the United States, exhibitors and projectionists welcome the appearance of an ALTEC field engineer.

Why?

Because ALTEC SERVICE is always one step ahead of the industry's continuing technical parade.

Whether your sound is optical, magnetic, optical-magnetic, single or multiple channel, ALTEC field engineers have the right answer for every problem.



ALTEC® SERVICE CORPORATION

Get in step with ALTEC. Join 6,000 ALTEC customers in the march to better sound.

161 Sixth Avenue • New York 13, New York

SPECIALISTS IN MOTION PICTURE SOUND

Vallen for

CURTAIN CONTROLS, TRACKS and SPECIAL OPERATING DEVICES

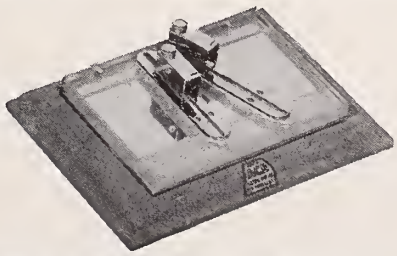
VALLEN, Inc.

AKRON 4, OHIO

Splicing Problems Are Coming!

The ACE CLEAR VISION FILM SPLICER is the *only* splicer designed to solve the problem of handling both acetate and Cronar film bases—plus film widths from 8-mm to 70-mm.

- It makes a strong splice on acetate.
- Will splice the new DuPont Cronar base and join Cronar to acetate.
- It is non-magnetic — Will not injure CinemaScope soundtracks.



See your supply dealer or write direct to

ACE ELECTRIC MFG. CO., 1458 Shakespeare Avenue, New York 52, N. Y.

THE SUPER CINEX LAMP

(*Continued from page 9*)

and total volume of light (screen lumens) can be obtained with our latest model, the Super Cinex:

Table A indicates that as much as 49,500 screen lumens can be obtained from the Super Cinex and that the ratio of side-to-center distribution of this light on the screen will be 70%. This compares with a total of 32,000 lumens and a 54% side-to-center distribution with 11-mm carbons. Despite the greatly increased light output, the hourly burn-rate for carbons used is only 17 inches in the case of the 13.6-mm trim, compared with 22 for the 11-mm trim.

Faster Optical Train

It must be pointed out, however, that all the benefits possible through use of the Super Cinex with a 13.6-mm trim cannot be obtained when this powerful lamp is employed with some models of projectors. Very fast lenses are also needed. In other words, a lumen output in the neighborhood of 50,000 lumens depends on the entire optical train of the projection system being just as modern as the Super Cinex lamp itself.

It is necessary, for example, to employ a projector mechanism to which the Super Cinex can be adjusted at its optimum *f*:1.6 working distance of 33 inches. The lens must be sufficiently fast to pick up all the light from this *f*:1.6 reflector position. For this purpose, an *f*:1.5 lens would be best. In addition, it must be mentioned that the shutter design of the projector should be such that the maximum light transmission is obtained. However, new projector designs and conversion equipment for present apparatus, plus faster lenses will shortly enable both indoor and, particularly, drive-in theatres to reap the full benefits of the Super Cinex.

In my opinion, a theatre which acquires Super Cinex lamps will not only benefit immediately in terms of increased light output, better and whiter light, and improved distribution of light on the screen, but in addition, these theatres will have the most modern lamps possible—lamps that will function at peak efficiency with the improved projectors and lenses shortly to be available.

In conclusion, it must be emphasized that greater light output is only one of the important advantages of the Super Cinex. Economy is also most important. Examination of Table B will show the very low cost in terms of carbon consumption and current at amperages ranging from 135 to 165.

TABLE B. APPROXIMATE BURNING RATE, POWER AND HOURLY COST.

Amps	Approx. Burn Rate per Hour	Approx. AC Power 220 volts	Power 2¢ KVA	Carbon 4¢ inch	Approx. Hourly Cost
135	6″	9.1 KVA	.18	.24	.42
140	7½″	10	.20	.30	.50
145	9″	11	.22	.36	.58
150	11½″	12	.24	.46	.70
155	13″	13	.26	.52	.78
160	15″	14	.28	.60	.88
165	17-18″	15	.30	.68	.98

The above chart is approximate, and is based as nearly as possible on present carbon costs and power at .02 per KVA. For the light produced an exceptionally low operating expense is indicated. The power range indicated between the thin horizontal lines is most generally used.

Closed-Circuit Pay TV

Paramount Pictures, with 85% interest in International Telemeter Corp., has announced that it is "seriously considering" entering the field of closed circuit-TV for home and business in large cities. Louis Novins, vice-president of ITC, declared that Telemeter would work with local groups interested in the installation of closed circuits in their communities.

In pointing out that closed-circuit pay-as-you-see TV does not require FCC approval, Paramount president Barney Balaban said it "could well be the basis for establishing the validity of pay television."

Meanwhile, the Jerrold Electronics Corp., of Philadelphia, another proponent of the "cable theatre" type of toll TV is negotiating for first-run films and other attractions to be shown in selected closed-circuit communities. A recent company report declared that Jerrold equipment is being used by more than 300 of the 450 community TV antenna systems now operating in the U. S. The report also stated that Jerrold now owns and operates the community systems in five cities, including Ukiah, Calif.; Flagstaff, Ariz.; Dubuque, Ia.; Pocatello, Idaho; and Key West, Fla., in which it has 80% interest. A master antenna system specifically designed for color television reception was introduced recently by the Jerrold Corp.

To Urge Projection Standards

A three-man committee has been appointed by Rube Shor, president of National Allied Drive-In Theatres, for the purpose of discussing the problems of projection standardization with members of the SMPTE. The ultimate aim of the committee is to try to induce producers to standardize aspect ratios. The committee was first proposed at the National Allied convention last February by Hugh McLachlan, chairman of the committee and engineering supervisor of Y. & W. Theatres of Indiana. The other two committee members are Richard Amstatt of Durkee Enterprises, Baltimore, Md., and Robert F. Morrell of S & S Amusement Co., Cincinnati, Ohio.

TABLE A. MAXIMUM ILLUMINATION; LIGHT DISTRIBUTION

Arc Lamp Optical Speed	Positive Carbon	Current	Lumens (light)	Hourly Burn Rate	Light Distribution
18-inch, *f*:1.7 reflector	11-mm standard	125 amps	32,000	22″	54%
18-inch reflector adjusted for *f*:1.6 speed	13.6-mm standard	160-165 amps	49,500	17″	70%

POOR PROJECTION

(*Contiuued from page* 15)

boulders could be hurled at the audience, they figured it didn't matter about the story. By the time a few really good pictures were made in the 3-D process, the public, and projectionists, and theatre managers were all thoroughly disgusted.

Then what about stereophonic sound? It is certainly true that a theatre is doing the industry a dis-service if it advertises this equipment when it isn't being used in the theatre. However, it must be remembered that stereophonic prints have not always been available to theatres even when they possessed the equipment to play them. Also, these prints are easily damaged and can arrive at a theatre containing a weird assortment of hums, hisses and bumps in addition to the dialogue and background music. A theatre may discover at the last last minute that it's one-track optical or nothing.

Widespread Misconception

There is a strong parallel between the opinions voiced in the letters to *Variety* and the outlook attributed recently by Tom Pryor, *New York Times* correspondent in Hollywood, to the average Hollywood producer. The producers feel that theatres suffer from sloppy management and these producers are inclined to refer to exhibitors as absentee showmen, real estate operators, or concessionaires. Harsh words these. Perhaps they are sometimes deserved, but the fact remains that the exhibition cannot be blamed for the technical ailments of the industry. The producers devised the new processes and they must bear their proper share of the responsibility for making them work.

It would be a fine idea for the men who wrote to *Variety* to examine Robert A. Mitchell's two-part article, "A Common Sense Approach to Screens, Apertures and Aspect Ratios," in the June and July issues of IP. They would then get some idea of the formidable calculating and juggling required, plus the different lenses needed to switch, for instance, from CinemaScope to non-anamorphic wide-screen projection.

The fact remains, however, that the screen image produced in many theatres is poor. Whatever the reason, every effort must be made to improve this situation as much as possible. It is here that the projectionist can make a contribution. As the only technically trained person in the theatre, he is in a position to ascertain just what can or cannot be accomplished in a particular house.

Toward a Solution

It was reported recently that the management of a large circuit proposed that projectionists take part in the regular staff conferences held by the manager and others working in the theatre so that the projectionist's ideas could be shared and management could get an accurate picture of what projection-room problems are. This is a step which obviously should have been taken long ago at all progressive theatres.

Many of the difficulties that bring complaints from customers result from a situation where the manager remains unaware of the cause and possible solution to technical problems that annoy his customers. The problems faced by many theatres today are not easy to solve, but the first step toward such a solution should be cooperation and discussion between management and the projectionist.

One step toward overall industry cooperation was reported in IP last month. The story described how Columbia Pictures had prepared a pam-

SPLICES NOT HOLDING ?

Film breaks are costly. Play safe by using

JEFRONA

All-purpose CEMENT

Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.

CAMERA EQUIPMENT CO.
DEPT. J-9-8
315 West 43rd Street New York 36, N. Y.
JUdson 6-1420



Super-Hilux®

THE PROJECTION LENS with GREATEST OVER-ALL INCREASE IN LIGHT TRANSMISSION

F:1.0 LIGHT COLLECTING SPEED

1 year in service . . . proven in hundreds of theaters!

1st to present an entirely new concept of theater projection!

1st to be designed with emphasis on acutance!

1st to be chosen by leading DRIVE-INS and THEATERS.

Four reasons why a Super-Hilux should be *1st* on your list of "Musts." Write for comparison tests and focal length computer to Dept. IP-96.

PROJECTION OPTICS

PROJECTION OPTICS CO., INC.
330 Lyell Ave., Rochester 6, N. Y.

phlet for projectionists in which it frankly admitted wide-screen projection had created problems that have not yet been solved. The pamphlet made some suggestions for maintaining the quality of a screen image under difficult conditions and asked the cooperation of projectionists until the situation is corrected.

Projectionists should be quick to bring flaws in the present-day projection process to the attention of management. This is particularly true with regard to focus of the picture because it may be felt that this trouble is caused by lack of interest on the part of the projectionist. To present the argument effectively there is no better ammunition than some comments by Robert A. Mitchell printed in the August, 1955, issue of IP. At that time other irate but untechnical moviegoers were also writing to *Variety* and complaining about fuzzy pictures. Mr. Mitchell's remarks warrant repeating here:

Editor, VARIETY:

Complaints of poor focus in present-day movies — several of which have been voiced in VARIETY—are entirely justified. Not justified, however, is the abuse your correspondents have hurled at the projection craft. Conscientious projectionists resent getting blamed for a bad condition, which is not their fault.

Projectionists, by and large, are competent craftsmen who are every bit as perturbed by blurry CinemaScope and widescreen pictures as is Edward Connor (VARIETY, July 13, 1955, p. 24). What the non-technical moviegoer does not realize, apparently, is that the picture on the screen can be no clearer than the picture on the film. And the photographic images printed on the release positive are very frequently at fault.

Experienced projectionists will tell you that the average release print of 30 or even 40 years ago possessed higher pictorial quality, as regards image detail, than the average modern print.

All of the image-definition faults of standard prints are more highly magnified on the screen than they used to be in the days of conventional 3:4-proportioned screens. Moreover, the short-focus lenses required for widescreen presentation in all but the long, narrow type of auditorium exaggerate focus drift, film flutter, and "breezing"—projection defects which went practically unnoticed before the mammoth screen invaded the theatre.

CinemaScope poses special problems on account of the anamorphic lenses employed. These lenses, used on both the camera and the projector, frequently introduce slight geometrical distortions and blur the vertical edges of objects.

Outcome Not in Our Hands

Old hands at projection—skilled craftsmen in every sense of the word—deplore the poor images so often encountered in release prints. Defective prints handicap the projectionist in the practice of his art and inspire the unwarranted brickbats which come crashing through the projection-room window.

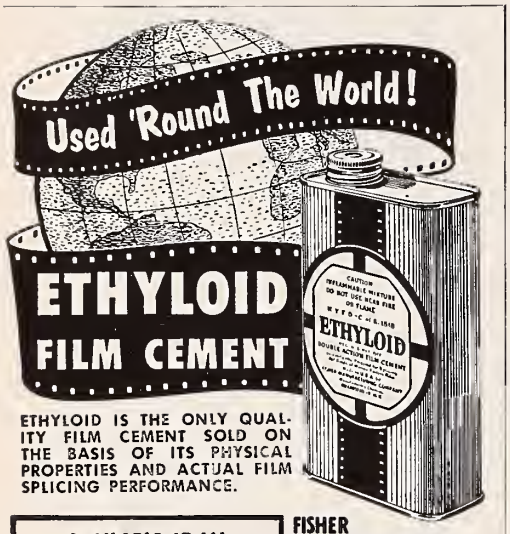
The non-technical critic ought to realize that the projectionist has nothing to do with photographing, printing, and processing the film. The man in the booth screens, to the best of his ability, the goop which is handed to him.

Color prints are a case in point. With prints made on Ansco Color and Eastman Color printing film, marvelously clear pictures may be expected. But most color prints for theatre use are made by the imbibition dye-transfer process, a method which is incapable of sufficient photographic resolution to withstand the acid test of terrific magnification upon modern wide screens.

Patrons annoyed by poor projection (and who isn't?) should complain, not to indifferent ushers, but to the manager of the theatre. The manager, like the projectionist, is intensely interested. An explanation of the trouble will then be demanded of the projectionist, and the projectionist, *the only trained technician present in the theatre*, is the man to supply it.

If the quality of the picture on the screen does not then improve (and chances are that it won't) it may safely be concluded that the projectionist is confronted with a hopeless defect—a fault indelibly imprinted on the film, and hence irremediable. In such cases the projectionist always suffers more than the complaining patron.

To this no further comments are necessary.



ETHYLOID IS THE ONLY QUALITY FILM CEMENT SOLD ON THE BASIS OF ITS PHYSICAL PROPERTIES AND ACTUAL FILM SPLICING PERFORMANCE.

AVAILABLE AT ALL THEATRE SUPPLY DEALERS

FISHER MANUFACTURING CO.
1185 Mt. Read Blvd.
Rochester 6, N. Y.

18th Cinemara Theatre

The 18th Cinerama installation in the U. S. opened a few weeks ago at the Paramount Theatre in Seattle, Wash. The theatre previously had been a regular run house operated by Evergreen Theatres. Following leasing to the Stanley Warner Cinerama Corp., extensive remodeling necessary for the accommodation of the three separate projection rooms reduced seating capacity from 3,000 to 1,396.

HUFF'S PACKAGE COOLING SYSTEM

Consisting of

(1) The Positive Carbon Cooler, (2) The Film Track Cooler, and (3) The Automatic Film Humidifier

will give you an advantage of from 10 to 25 per cent more screen light than is now available from your 16- or 18-inch mirror lamps used with Brenkert or X-L heads, plus a saving of 50 per cent lamp maintenance cost.

See your dealer or write direct to

HAL I. KUFF MFG. CO. ○ 3774 SELBY AVENUE LOS ANGELES 34, CALIF.

Lorraine ORLUX SUPER-CHARGED LARGE-CORED Carbons

For DRIVE-INS & THEATRES with HUGE, WIDE-AREA SCREENS • CARBONS, Inc. BOONTON, N.J.

MAGNETIC TRACKS

(*Continued from page* 12)

optical sound provides a more level response over the main range of reproducible frequencies than is possible with CinemaScope magnetic sound. If the frequencies in the 8,000-10,000 cycle range are amplified to the same degree as lower frequencies in both processes, it is found that optical sound requires a less exaggerated treble boost in the compensating amplifier, resulting, as far as wide-range reproduction is concerned, in less ground noise *and a wider dynamic range* than is possible with the CinemaScope sound process.

It is to be noted, in this connection, that deficient signal strength above 4,000 cycles is an inherent and irremediable characteristic of CinemaScope magnetic tracks. Only in the lower frequencies does the CinemaScope method excel optical sound as regards the signal-to-noise ratio.

Several studios and processing laboratories have made use of a short strip of 12,000-cycle optical track for many years as a check on film slippage in the release printers. Even routine printing and processing results in a sharp copy of this high-frequency test track; and any properly focused optical soundhead will respond to this frequency even though the filter networks and speakers prevent its reproduction as sound.

Practical Limitations

The 1¼-mil scanning beams used in most soundheads of American manufacture are not suited to the reproduction of frequencies exceeding 10,000 cycles per second, of course. The old standard 1-mil scanning beam is better suited for the reproduction of 12,000 cycles, while the European 0.75-mil beam (approximately the same width as the 0.7874-mil CinemaScope magnetic gap) responds well, as does the 0.6-mil beam used in certain cylindrical-lens scanning systems, to 15,000 cycles, the practicable frequency limit in optical recording.

The effect of the wider (1¼-mil) scanning beam in providing more efficient track illumination with an appreciable reduction of ground noise (caused by emulsion grains and microscopic scratches) is considered to outweigh the minor disadvantage of a slightly lower top cut. To repeat, the actual tonal difference of 8,000 and 12,000 cycles is only 2/3 of an octave; and 8,000 cycles is approximately one octave above the highest note on a piano keyboard.

Since high-fidelity reproduction primarily involves level response over the main audible range from 40 or 50 cycles to 8,000 or 9,000 cycles with a

Cinemiracle Screen Flown In

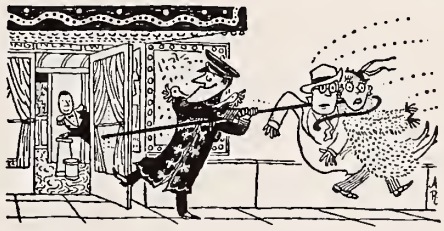
The largest seamless screen in the world was shipped recently by Cinemiracle via air transport from Los Angeles to New York. With the installation of the screen at the Mt. Eden Theatre in the Bronx, N. Y., Cinemiracle is now set for full scale shooting and testing. The theatre is being used by producer-director Louis de Rochement as a production studio and projection laboratory for Cinemiracle's first feature.

The large newly-arrived screen is a product of the Bodde Screen Co. of San Fernando, Calif. Manufactured into a single piece of material 36 feet by 81 feet, the white matte screen was especially designed for the Cinemiracle process. The only other screen of similar size and construction is the Bodde seamless, 41 feet by 72 feet, which is installed at the Radio City Music Hall in New York.

Your decor may dazzle 'em...



Your house-front may invite 'em...



BUT EVERY PERFORMANCE STILL MUST BE PERFECT!

Perfect performances require equipment that's right on the ball thraugh every faot of film. Things are always ready to rall when yau deal with an expert RCA Theatre Service Engineer. *Nabady* else has that vital suppart fram all RCA's technical resources.

RCA SERVICE COMPANY, INC.
A Radio Corporation of America Subsidiary — Camden, N. J.

Clayton Ball-Bearing Even Tension Take-Ups
For all Projectors and Sound Equipments
ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS.
SILENT CHAIN DRIVE
THE CLAYTON REWINDER
FOR PERFECT REWINDING ON 2000-FOOT REELS.
CLAYTON PRODUCTS CO.
31-45 Tibbett Avenue — New York 63, N. Y.

minimum of ground noise, distortion, and intermodulation, a raising of the top cut to 10,000 or 12,000 cycles (tones so high as to be scarcely audible) has little or no effect in improving the naturalness of the reproduction. In fact, extension of the reproduced range of frequencies has a bad effect, restricting the dynamic range, when it results in a disproportionately high ground-noise level.

"Self-Cancellation"

The frequency range of CinemaScope magnetic tracks, no wider than modern optical tracks provide in any case, is unfortunately seriously reduced by repeated playings of the film and by "self-cancellation" effects which tend to erase from magnetic tracks all of the higher frequencies.

The average *used* CinemaScope print played on equipment in average condition reproduces a range of only 40—7,000 cycles, with serious attenuation above 3,000 or 4,000 cycles. This does not mean that frequencies in the 7,000—10,000 cycle range are absent, but rather that their relative signal strength has been greatly reduced by adverse influences encountered in normal use. Optical tracks retain the greater part of their original high quality throughout the entire useful life of the print. CinemaScope magnetic tracks subjected to projection use do not, the sound reproduction becoming increasingly "muffled" and dull.

The average moviegoer, it is safe to say, is quite unable to tell the difference between good single-channel magnetic sound and good single-channel optical sound, the latter being optical-track transfers from wide-track magnetic originals. A trained ear can tell the difference only if the sound quality is not up to par, *but only because the magnetic sound is certain to be the poorer!* Aside from the matter of noise pickup, the inherent photographic and optical distortions of optical sound are never as noticeable as the harsh "even-harmonic" distortions of magnetic sound played on worn or poorly designed magnetic reproducers.

From the projectionists' point of view, the use of single-channel magnetic sound entails a number of operational disadvantages without perceptible improvement in sound reproduction.

(1) Special handling of expensive prints is required; (2) the condition of the magnetic reproducers must be checked at frequent intervals, with yearly replacement of costly magnetic clusters; (3) periodic demagnetization of projector, soundhead, and rewinder parts is necessary; (4) more complicated film threading increases the likelihood of threading errors; (5) increased emulsion-scratching, perforation wear, and other forms of film damage; (6) the use of narrow-tooth sprockets also increases perforation damage in regular prints.

If all these difficulties weren't enough to insure headaches aplenty, the unpleasant possibility of a "combination" magnetic-optical print hangs over the heads of projectionists like a Damocletian sword and promises severe migraine in the form of noticeably inferior optical sound and pictures scratched by prior use in magnetic soundheads.

The Combination Print

As conceived some time ago under the protests of competent studio sound engineers, the combination print has regular CinemaScope magnetic tracks and an optical track only 0.038 inch wide, *less than half as wide as the standard 0.084-inch optical track.* Sound volume is thereby reduced to about one-half normal volume by the narrow optical track; and when the volume control is turned up by the projectionist, the noise level is approximately doubled. Furthermore, any attempt by the studios to minimize these defects of the narrow optical track by overmodulating the recorded signal necessarily reduces the dynamic range and may introduce distortion.

Originally proposed as a measure for combatting distribution difficulties in the allocation of magntic- and optical-track prints, the combination-print proposal could not survive in a hostile atmosphere. Many exhibitors were unwilling to install narrow-tooth CinemaScope sprockets in their projectors for the dubious privilege of assaulting their patrons with inferior sound from reduced-width optical tracks. Projectionists, too, have refused to allow service engineers to install narrow-tooth replacement sprockets in their projector mechanisms and optical soundheads.

There is no question in the author's mind of the supremacy of optical sound in the field of commercial motion-picture exhibition. In the early days of sound pictures, the sound-on-disk process was capable of giving sound of a higher quality than sound-on-film. But optical sound quickly attained the high quality of Vitaphone sound-on-disk, and then surpassed it. History has repeated itself in the case of CinemaScope magnetic-track sound.

[THE END]

Q: When is a mistake a blunder?

A: When a projectionist is not a regular subscriber to IP—a MUST reading for the projectionist craft.

Use the handy order form below

INTERNATIONAL PROJECTIONIST
19 West 44 St., New York 36, N. Y.

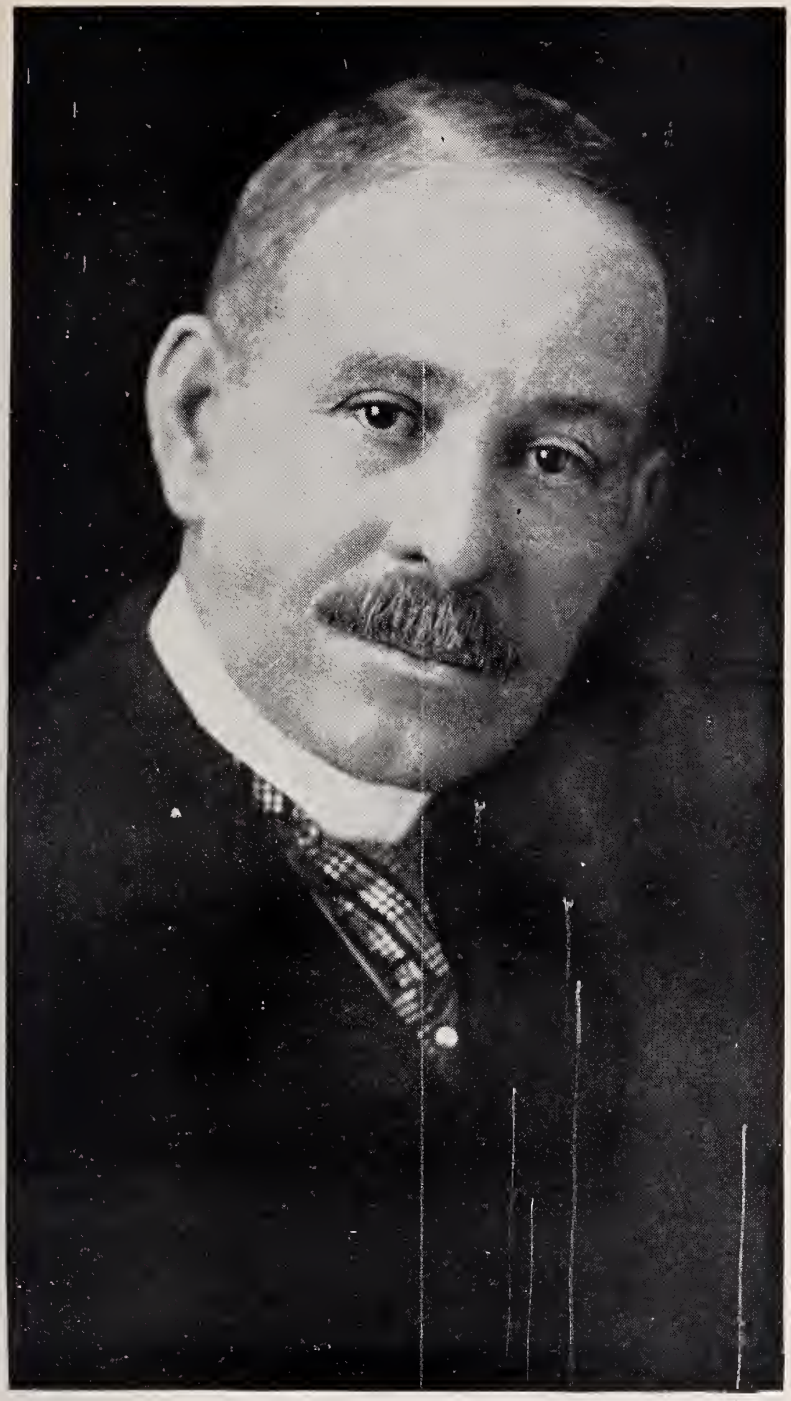
Enter my subscription for ☐ 1 year (12) issues—$2.50
☐ 2 years (24) issues—$4.00

Foreign and Canada: Add 50c per year

Name .....

Address .....

City ..... *Zone* ..... *State* .....



DIAGNOSIS:
knife wound in the heart



UNDER THE blazing blue sledge hammer of a Chicago heat wave, the cramped, makeshift operating room shimmered like an oven, reeking of ether and carbolic. Six sweat-drenched, frock-coated doctors huddled in fascination, watching deft hands reach into a human chest and expertly stitch up a wound in the redness of a pulsing heart.

Would he live? The surgeon mopped his brow and hoped. The year was 1893; the operation, fantastic.

Live? Yes, he would live for many more years, thanks to the skill and courage of Dr. Daniel Hale Williams.

Abandoned as a child, Williams, a Negro, had struggled hard for his medical education. Now only 37, he had already founded America's first interracial hospital, Provident. And here he had just performed the first of the pioneering operations that would mark him as one of our country's great surgeons.

Sensitive and brave, Daniel Hale Williams was blessed with an abundance of the same urge to help his fellow man that binds and strengthens Americans today.

And it is these strong, unified Americans who are our country's real wealth—the real backing behind our nation's Savings Bonds. In fact, they're the true reason why U. S. Savings Bonds are considered one of the world's finest, safest investments.

For your own security—and for America's—why not invest in Savings Bonds regularly? And hold on to them!

It's actually easy to save—when you buy Series E Savings Bonds through the Payroll Savings Plan. Once you've signed up at your pay office, your saving is done *for you*. The Bonds you receive pay good interest—3% a year, compounded half-yearly when held to maturity. And the longer you hold them, the better your return. Even after maturity, they go on earning 10 years more. So hold on to your Bonds! Join Payroll Savings today—or buy Bonds where you bank.

Safe as America – U.S. Savings Bonds

The U.S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

PUBLIC SERVICE · ADVERTISING COUNCIL

"New Baby?

No!...New Simplex!

T.M. REG. U.S. PAT. OFF



"Just between us projectionists, having twins couldn't make me prouder than I am of my new Simplex X·L's. To me, they're the answer to a projectionist's dream. What performers! Quiet...Smooth... as dependable as 'Old Faithful'. They even seem able to add new life to worn out prints! You've got to run a Simplex X·L to really appreciate it! So if you want to be as proud as I am...see what you can do about getting your boss to install a...

Simplex X·L

T.M. REG. U.S. PAT. OFF

PROJECTION and SOUND SYSTEM

MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION • DISTRIBUTED BY NATIONAL THEATRE SUPPLY

SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

GPE

PROJECTIONIST

INTERNATIONAL



OCTOBER 1956

VOLUME 31 • NUMBER 10

30c A COPY • $2.50 A YEAR

No lamp in the World!

CAN PRODUCE SO MUCH LIGHT.

Peerless HY-CANDESCENT TRADE MARK REG.

CINEARC

NOT A REFLECTOR ARC!

WRITE FOR DATA

Peerless MAGNARC TRADE MARK REG.

CINEARC

A 75-77 AMP. REFLECTOR ARC!

22,000 TOTAL LUMENS ON SCREEN

NO-HIGH-RATE *OF ($60.00) REFLECTOR BREAKAGE AND SILVERING DETERIORATION OR HEAT FILTER UPKEEP* !

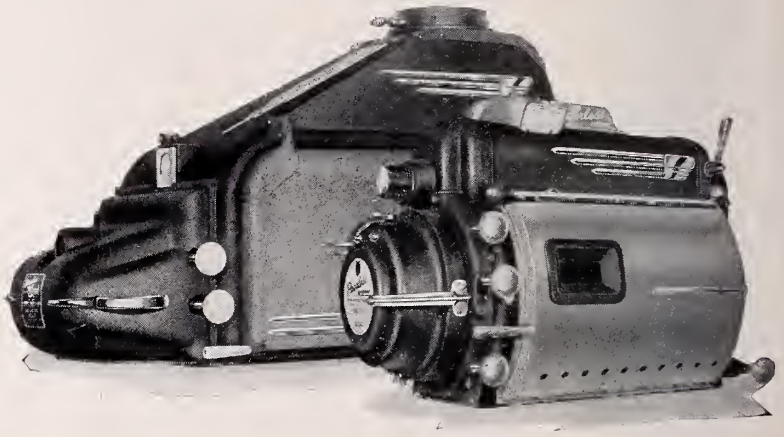
— PROOF —

Hy-Candescents were selected for all **important** "CINERAMA" installations. (Chicago, New York, Los Angeles, San Francisco, Philade!phia, and Washington, D. C.)

Hy-Candescents were chosen by Paramount for **all** installations of Horizontal "VISTA-VISION".

Hy-Candescents were again selected by TODD-AO for "OKLAHOMA".

You have to do the same if you want all the light there is for big pictures.



At 75-77 amperes . . . With presently available and standard 8 x 9 m/m copper coated carbons . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . With a 14" diameter No. 2012 PEERLESS "Hy-Lumen" glass reflector that retails at a list price of $22.00 F.O.B. Chicago . . . With a No. 2880 PEERLESS Tail Flame Flue . . . On any kind or any size screen . . . No Heat Filter required.

All of this, at the **lowest** possible first, and operational **cost.** And ———————

J.E.McAULEY MFG.CO.

552-554 WEST ADAMS STREET

CHICAGO 6, ILLINOIS

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

Which theatre is yours?



FOGGY PICTURE AND SOUND



WIDE SCREEN WITH STEREOPHONIC SOUND*

Studios put top quality on their films—
Do audiences get this quality in your theatre?

Good projection requires the best modern lenses and projectors, today's high powered arc lamps and rectifiers, the latest wide screens and stereophonic sound* (and, of course, the most competent of projectionists).

Westrex supplies the best in theatre equipment including

- **THE WESTREX**
- **WESTREX Standard**
- **WESTREX Economy**

Sound Systems.

***Three channel, four channel and six channel.**

Westrex

Westrex Corporation

111 Eighth Avenue, New York 11, N. Y.

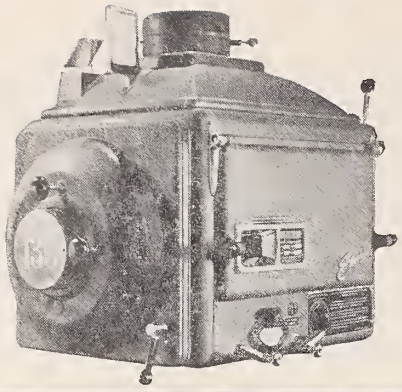
Hollywood Division: 6601 Romaine Street, Hollywood 38, Calif.

STUDIO RECORDING SYSTEMS

•

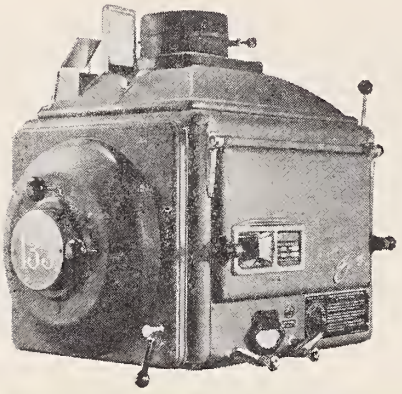
THEATRE SOUND SYSTEMS

THERE'S AUTOMATION



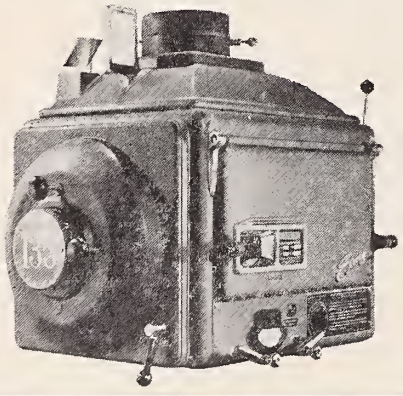
in projection lighting, too! New projection techniques have imposed conditions of arc operation and control so critical as to make it an absolute necessity. Error in the position of the positive crater, of as little as 1/32", can cause light color change, even actual loss in screen illumination.

IN PROJECTION LIGHTING



The Lightronic Crater Positioning System, a feature of the Strong Super 135 lamp, insures against losing business through faulty presentation. It automatically controls the burning of both carbons, maintains the correct gap length always, and holds the positive crater at the EXACT focal point of the reflector. A perfect light of constant intensity and unchanging color, evenly distributed, is maintained without manual adjustments!

WITH THE *Strong* SUPER "135"



You can, with quick simple changes burn 9, 10 or 11 mm regular or 10 mm Hitex carbons, to attain any desired degree of operating cost, screen illumination, and burning time. The correct light requirements for any presentation technique—even two or more on the same program! It's truly all-purpose—truly the greatest!

Impartial Foot-Candle-Meter Tests

Prove that the Strong Super 135

Projects the Brightest Pictures Today!

THE STRONG ELECTRIC CORPORATION

"The World's Largest Manufacturer of Projection Arc Lamps"

31 City Park Avenue • Toledo 1, Ohio

Please send free literature on Strong Projection Arc Lamps.

NAME_____

THEATRE_____

STREET_____

CITY & STATE_____

International PROJECTIONIST

R. A. ENTRACHT, *Publisher*
JAMES MORRIS, *Editor*
R. A. MITCHELL, *Contributing Editor*

Volume 31 **OCTOBER 1956** **Number 10**

Index and Monthly Chat 5

Lubrication of Projector Mechanisms 7
ROBERT A. MITCHELL

Motion Pictures and TV Grew Up Together 10
ALBERT ABRAMSON

Elaborate New Hardtop Theatres Going Up 14

TESMA Maps Plans for Changing Times 17
ROBERT SHUMANN

Shape of Things to Come 18
JOSEPH HOLT

In the Spotlight 20

Projection Work in VA Hospitals 21

Technician's Viewpoint 22

New GE Lamp for Low-Contour Projectors 23

Letters to the Editor 24

Science Notes 24

Personal Notes 26

Memories of a Crazy Nickelodeon 27
PAUL GORMLEY

Ray Brian—"Movieana" Archives, XII 28

Columbia Issues Lighter-Density Prints 29

Book Review 31

Miscellaneous Items, News Notes, Technical Hints

INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co., Inc., 19 West 44 Street, New York 36, R. A. Entracht, President. Telephone: MUrray Hill 2-2948. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States and U. S. Possessions, $2.50 per year (12 issues) and $4 00 for two years (24 issues). Canada and Foreign countries: $3.00 per year and $5.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Entered as second-class matter February 8, 1932, at the Post Office at New York, N. Y., under the act of March 3, 1879. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1956 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

420

Monthly Chat

Technical Experts Collide

TWO INDUSTRY NOTABLES, Loren Ryder, of Paramount (VistaVision), and Earl Sponable, of 20th Century-Fox (CinemaScope), have been at odds with each other, officially at least, since the introduction of the new processes. Both appeared on the panel of the Equipment Showmanship Forum at the recent TESMA convention in New York, and the prescriptions they offered as a cure for the technical and boxoffice ailments of the motion picture exhibition industry varied as usual—at least on the surface.

Ryder told the assembly that the industry is in need of a council of engineers, manufacturers, exhibitors and others to sit down and analyze the physical problems of the theatre. Sponable, when he spoke, denied there was any need for a "great new research organization." What is needed, he asserted, " . . . is a concrete plan to bring order to the confused technical situation and a program to utilize the technical improvements that are ready and waiting. My formula calls for standardization and modernization on an industry-wide basis," he concluded.

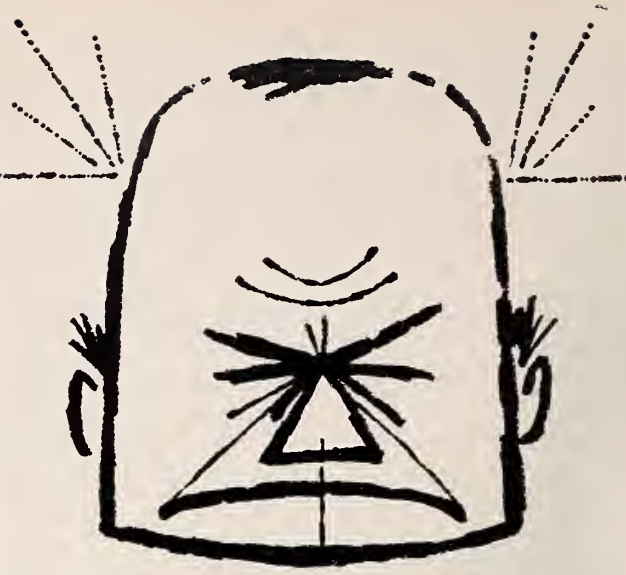
What strikes us most sharply about the above statements is that they differ only on the surface. Evidently both gentlemen realize that there is technical trouble in the theatres. They know that, very often, the installation of new process equipment did not bring results that were up to expectations. Certainly action is needed. Anyone doubting this has only to read the remarks of Leonard Goldenson, president of ABC-Paramount Theatres, made at the same convention. Goldenson foresees a further decline in the motion picture audience and the closing of more theatres. But let's face it. Hollywood sometimes asks too much from the projection machine. Technical improvements are absolutely necessary, but they can't do the whole job. As Shakespeare said, "The play's the thing."

Projecting Foreign Films

JUST HOW FAR the trend will go is not yet certain, but there is at present a concerted effort on the part of European film producers to sell more of their product in the United States. Because of the shortage of feature films from Hollywood, many American exhibitors who felt in previous years that foreign films were death at the boxoffice are now changing their minds. It is likely that many projectionists outside the art-house circuit will shortly find themselves showing foreign-language films.

Because of variations in technical standards since the introduction of the new processes, these films my require special handling. Aspect ratio is an important point to consider. Films made in Europe do not always have their action contained within an area of the film frame that allows for cropping at top and bottom by a wide-screen aperture. Heads and feet and parts of the superimposed English titles may be lost. It is also true that some of these pictures, particularly if black-and-white, may emphasize dark low-key lighting that makes wide-screen projection difficult.

EQUIPMENT WEAR AND TEAR
GOING TO YOUR HEAD?



RCA INTRODUCES BRAND NEW SAVINGS IN REPLACING WORN MAGNETIC HEADS

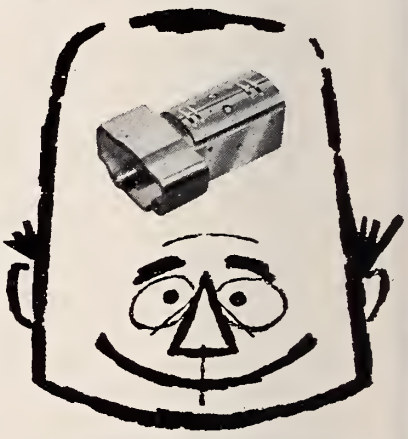
Time was when a complete magnetic cluster had to go whenever pick-up heads wore out in your sound system. But not any more, thanks to the latest development by RCA theatre-equipment engineers. RCA's new magnetic cluster—designed to fit *any* RCA button-on soundhead—introduces a removable cap that means hefty savings on that old problem of pick-up heads that wear out. Here's how it works.



Here's your original magnetic cluster, the unit you previously had to replace entirely. Now, you can insert a new cap at a *fraction of the cost* of the whole cluster.



Here's the heart of this new RCA development . . . the removable cap that incorporates fresh pick-up heads for reproduction of one or four magnetic tracks.



And here's your end result . . . a cluster working like new because it has brand new pick-up heads. You've saved plenty of money and time, thanks to RCA engineering.

This replaceable cap typifies the way engineers work things at RCA. They make the best product possible, then go on improving it, finding ways to make it work better and longer and easier. This all means better business for you . . . and the sooner you call your independent RCA Theatre Supply Dealer the better. He's ready to help you start saving with RCA's new magnetic clustercap.

RCA®

THEATRE EQUIPMENT SALES
RADIO CORPORATION of AMERICA
CAMDEN, N. J.

the Line that builds Lines at Your Box-Office

RCA THEATRE EQUIPMENT

INTERNATIONAL PROJECTIONIST

Volume 31 OCTOBER 1956 Number 10

Lubrication of Projector Mechanisms

By ROBERT A. MITCHELL

Steadiness of a screen image depends on smooth, precise action of the projector mechanism. Proper lubrication is all-important.

UNLIKE the "live" television process, motion-picture machines (cameras for "taking" and projectors for "showing") involve gear trains and special mechanical movements for pulling down and exposing the ribbon of photographic film one "frame" at a time, 24 each second.

There are, for example, no continuously moving parts in a TV receiving set. Disregarding the tuning knobs and the vibrating diaphragm of the speaker, the only moving parts in a TV set are electrons. These subatomic charged particles are so nearly weightless that a stream of them in a TV picture tube can be modulated and deflected almost instantly.

The photographic motion-picture process, on the other hand, is *mechanical* as well as optical. Machinery run by motors is needed. But even the TV industry would become a shambles if it were not for the sustaining power of *filmed* subject matter. So even though it is an electronic process, commercial TV is completely dependent for its success upon the conventional optical-mechanical method of photographing, processing, and reproducing motion-picture films.

"Electronic photography" *via* magnetic tape has been exhaustively tested, even on the air; and even though it involves mechanical transport of a "record"—the tape.—picture quality in the electronic process does not equal that of conventionally filmed TV programs, not to speak of theatre motion pictures.

Theatre movies represent the *acme*, the peak of perfection, of the film process of recording and reproducing scenes in motion. The average picture on the screen of the average theatre has many times the pictorial quality of the picture broadcast by the average TV station and received by a set in average condition—and even if the TV picture be a "live" broadcast!

Projectionist's Duty

Now, because we have *machines* to photograph and reproduce motion-picture films, the care of the mechanical gearing of those machines is of prime importance. There are gears and bearings to receive painstaking attention. Projectionists accordingly find that cleaning and lubricating their projectors is a necessary part of their job. But the manufacturers of modern, automatically lubricated mechanisms have greatly simplified this task, as we shall see.

Provisions for the lubrication of motion-picture machines did not receive too much thought from projector designers in the early days of the art. The Powers projector, for example, or the Ernemann I, the Simplex Regular, of the Motiograph models 1A, D, E, F, H, and HU, had individual oil holes at the bearings, each bearing to be lubricated individually. It took a lot of the projectionist's time to apply the narrow-spout oil can to all of the numerous oil holes. Moreover, some of the oil holes, particularly those in concealed places, were in grave danger of being overlooked, with consequent excessive wear of certain bearings. An oiling chart should be drawn to assist relief projectionists in theatres where old-style mechanisms are used.

Lubrication of the bearings and other moving parts of a projector mechanism provides smoother, quieter, and cooler operation with less wear because it substitutes "fluid friction" (the slippage of liquid layers) for the "solid friction" of metal upon metal which produces heat and rapid abrasion. Most of the surface area of an adequately lubricated shaft journal is *actually separated* from its bearing by a film of oil! There is a certain amount of metallic contact, to be sure: but such metal-to-metal contact in a well-oiled bearing amounts to only a small fraction of one per cent of the total surface area.

No one knows for sure just how a lubricant acts. Such factors as the viscosity of the lubricant, its rubbing speed, and the thickness of the oil film are tremendously important, but other factors, less well known, play a significant part in making projectors run more smoothly. "Oiliness," or the

"body" of an oil, for example, has never been defined satisfactorily. It cannot be determined by measurements of viscosity and specific gravity. In other words, oil has better lubricating properties than molasses or sulfuric acid of the same viscosity and density, a fact which has led scientists to theorize that a lubricating oil or grease assumes special properties at its surface, where it does the job of lubricating. Considering that most lubricants have long chain-like molecules, a special alignment of the surface molecules may account for "oiliness."

Because oiliness and other characteristics of a lubricant are determined by the nature and amount of the individual components in the mixture, it is advisable to heed the projector manufacturer's recommendations anent lubricants. Use nothing but his own brand, if that's what he advises. Whereas most projector oils consist largely of refined petroleum oils of the type used in automobiles, the presence of small amounts of such vegetable oils as castor oil give the desired amount of oiliness. The recommended greases are complex mixtures difficult to duplicate exactly without having the manufacturer's own formulas.

Pointless Secrecy

It is the opinion of this writer that, in addition to recommending his own brand of lubricant, the projector manufacturer should name a few easily obtainable substitute lubricants of satisfactory lubrication characteristics and, for the sake of intellectual honesty, publish the formulas by which he compounds his own oils and greases. His financial success is certainly not predicated upon so minuscule an item.

Lubrication of the intermittent movement is the projectionist's first concern. The high-speed accelerations and decelerations of the precision moving parts of this component demand continual and adequate lubrication of all its contacting surfaces. A "dry" geneva-type movement wears very rapidly and binds up due to an expansion of the starwheel and cam caused by friction-generated heat. Even a small degree of wear ruins a geneva intermittent, producing noisy operation and jumpy pictures.

Most projectionists have never witnessed the kind of accident which ensues from an absolutely dry intermittent. The writer has seen it in the case of theatre projectors operated by inexperienced Army projectionists. Disaster is presaged by an audible strain on the projector motor. The starting winding may cut in and out several times. Then the intermittent movement emits a scream—and freezes dead. At that very moment, usually, the main drive gear strips its teeth. Such an accident can only happen, of course, with projectors of the older type which do not have automatic centralized lubrication.

A few of the very earliest geneva-movement projectors, such as the Optigraph of 1898 and the Edison Kinetoscope of 1906, employed "open" intermittents. The unenclosed star and cam had to be oiled each time a reel of film was projected. Needless to say, most of the oil had been thrown off by the time the end of the reel was reached!

Grease for Intermittents

The Powers projector of hallowed memory utilized a unique "pin-cross" enclosed intermittent movement which ran in grease. All modern projectors, the Motiograph excepted, have geneva movements which run in oil—the same type of oil used for lubricating all the other moving parts of the mechanism.

In the Motiograph projectors, including models H, HU, K, AA, and AAA, the geneva intermittent housing requires the insertion of Motiograph Intermittent Grease only once every 6 months. (The star and cam shafts of the AA and AAA have grease-packed ball bearings which require no further lubrication for their long lifetime.) To grease the Motiograph intermittent, merely remove the plug in the face of the movement housing and use the grease gun provided by the manufacturer, bringing the grease up to its proper level. If an oversupply of grease is forced in, the excess will come out of the vent on the gear side of the mechanism.

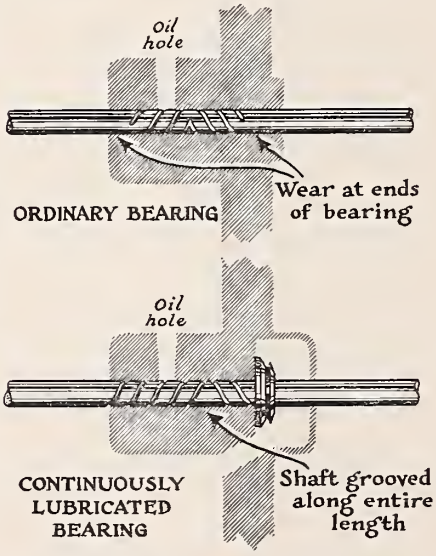


FIGURE 1. The difference in lubricant-conducting "grooving" used for hand-oiled and automatically lubricated shaft journals. Note that hand-oiled journals are grooved only in the middle of the bearing to prevent oil from running out of the ends of the bearing. As a result, the ends are apt to run too dry and wear excessively. When the ends of the bearing are worn, oil leaks out of the bearing very rapidly.

Fluid-Oil Lubrication

The serviceable and world-famous Simplex line of projectors has always had a geneva intermittent requiring fluid oil, not grease. For this reason, the Simplex Regular, the Super Simplex, and the models E7 and XL have an intermittent housing for the star, cam, and 1-to-1 cam-displacement gears known to most projectionists as the "oilwell." (The Simplex XL intermittent is differently constructed insofar as the flywheel is fastened to the cam shaft, and the displacing gears are *outside* of the oilwell.)

The intermittents of the Simplex Regular and Super Simplex mechanisms are oiled by means of a hollow tube, reached from the gear side, which conducts the oil directly into the intermittent oilwell. (It may be necesary to rotate the framer knob or handle to bring the oil tube into a convenient position for the introduction of oil. Some Simplex intermittents have *two* oil tubes, one for filling the oilwell, and the other for lubricating the bearings.)

Oil is introduced into the oil tube of the Simplex intermittent by means of a narrow-spout oil can (the "ejector" type is good) until the oil level comes up to an oil-level mark on the small circular sight glass on the film side when the projector is at rest. *Never oil a projector while it is running!*

Excess oil will do no harm except as it forces its way through the bearings and soils the mechanism. Surplus oil will accumulate upon the floor of the head, and must be removed to avoid soiling the optical soundhead. An oil-drain plug is provided on the film side of the oilwell to permit drainage of the oil for a complete change.

This is not necessary except at intervals exceeding 6 months. The old oil should be drained off into a large wad of cotton waste.

The Simplex E7 intermittent oilwell may be filled from either side, two oil cups being provided. It is recommended, however, that the E7 intermittent be oiled from the drive side, as an accidental excess of oil will only add to the lubrication of the gears, and not soil the film compartment.

The XL intermittent receives lubrication automatically from the general oiling system, and requires no individual lubrication. But the outboard bearing of the starwheel-and-sprocket shaft on the film side of all Simplex projectors requires a small drop of oil every day or two.

Follow Instructions

Use only Simplex Oil for oiling Simplex projectors. In fact, the use of any other kind of oil on a new Simplex mechanism may void the factory guarantee. Simplex Oil has been especially compounded to give maximum wear resistance, surface-film strength, and anti-corrosion properties.

The geneva intermittent movements of RCA (Brenkert) projectors are automatically lubricated by the general oiling system as in the Simplex XL and such European projectors as the Philips FP5, FP6, and FP7 and the Ernemann models VIII, IX, and X. (This matter will be discussed later.)

Brenkert projectors (models BX-40, BX-60, BX-62, and BX-80) incorporate a lubrication system which is *continuous* in action. There is no outboard bearing to be lubricated because a long-shaft, single-bearing intermittent of extremely rugged design is used. The oil for the entire mechanism should be Brenkert Projector Oil, a special lubricant having all the properties necessary for optimum performance. The use of other oils may result in hard starting and possible damage to the mechanism.

The disadvantages of the old-fashioned individual oil-hole method of mechanism lubrication are many. The time it takes to oil such a projector by hand, together with the possibility of neglecting some of the oiling points, has been mentioned. Leakage of oil from the separate bearings must also be considered. If only small quantities of oil are applied at one time, applications must be frequent — at least once a day in the case of hand-oiled mechanisms of the Simplex Regular type, or once every couple of hours in the case of the Powers machine.

Grooved Bearings

In order to retain the oil in the bearing as long as possible, many shafts are grooved over their journal section (the section of the shaft which is in the bearing). Rotation of the shaft then tends to work the oil in from both ends to the middle of the bearing. But the grooving cannot be extended over the entire length of the bearing, however, as the oil would then run out very rapidly, soon rendering the bearing too dry for safe operation.

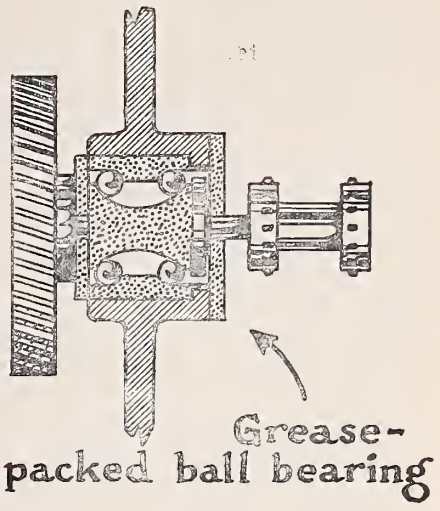


FIGURE 3. A ball bearing of the type which is packed with grease and sealed by the manufacturer. Sufficient lubrication is provided to last for the long lifetime of the projector.

A shaft is accordingly grooved up to within a short distance from the end of each bearing; and while this expedient helps keep the middle of the bearing (the least critical area) fairly well lubricated, the ends may not get enough oil. This is especially true in the case of high-speed shafts. The mechanically critical ends of the bearing then wear away, allowing the oil to leak out, soiling the film compartment of the mechanism and dripping down into the soundhead.

"One-Shot" Method

The pressure-feed method utilizing oil tubes leading from a central oil reservoir has some of the disadvantages of hand oiling. The so-called "one-shot" variant of the centralized system is, in fact, merely a method of hand oiling from a single point, namely, the plunger of the pressure pump. This method, exemplified in the Simplex E7, employs oil tubes leading directly *into* each bearing from the oil reservoir of the pump.

The oil pump of the Simplex E7 is not automatic. It must be worked by hand. The oil reservoir is filled until the oil level is just below the top of the sight glass. To oil the mechanism, the pump plunger is depressed a few times until the back pressure causes it to rise slowly when released, instead of abruptly. Pumping action takes place during the return of the plunger, forcing oil through a tube to the central distributor box,

(*Continued on page* 33)

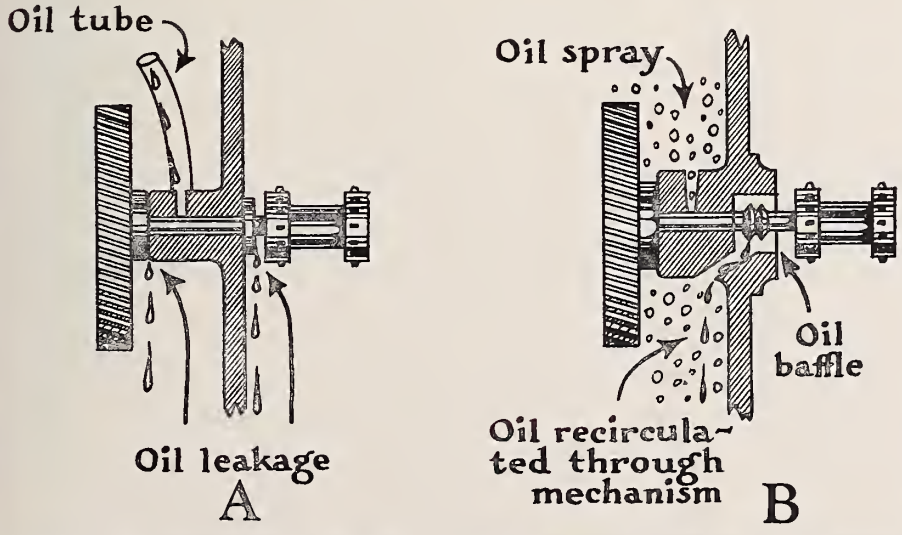


FIGURE 2. The construction of hand-oiled (A) and automatically lubricated (B) projector-mechanism bearings. As formerly designed, the hand-oiled type of bearing enabled oil to leak into the film compartment, soiling the film and dripping down into the soundhead. Continuously oiled bearings are provided with a slinger, or baffle, which prevents oil leakage.

The author traces the early beginnings of motion pictures and television to 1900. The important contributions of Edison and others are discussed.

Motion Pictures and TV Grew Up Together†

By ALBERT ABRAMSON

THE history of the electronic motion picture begins with that of the regular motion picture. It is generally agreed that Edison and his associates were the first to reduce the motion picture to practice. The creation of the phonograph in 1877 by Thomas A. Edison was important for two reasons: its discovery led him to invent the motion picture machine, and it was on a phonograph record that the first television recording was made.

Edison was pleased with his phonograph, but he became interested in adding a picture to the sound. In 1887 he set his assistant, William K. L. Dickson, at the task of making motion pictures on what was almost a phonograph cylinder. "A little drum was coated with photographic emulsion and was put to recording motion under a tiny camera just as the phonographic cylinder coated with wax records sounds under a diaphragm controlled needle."*

Intermittent Action

Dickson soon discovered that the cylinder must be stopped intermittently in order to register pictures on the emulsion. "In time Edison and Dickson contrived to get a picture-recording camera that did start and stop 48 times a second. The little pictures on the cylinders were hardly as large as the end of a dance program lead pencil. They were photographed in spirals around the cylinder, just like the spiral soundwave records of the phonograph."*

The little machine was the father of Edison's motion picture camera and the grandfather of motion picture machines since that time. It had many drawbacks—the main one being that it could not be played back as the phonograph could—and these objections led Edison to discard it and look for another medium on which to record his images. This search was ended in

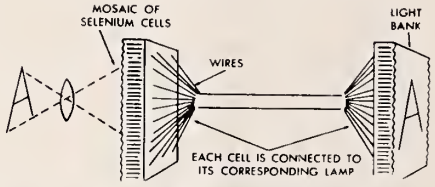


FIG. 1. Carey's 1875 mosaic method of transmitting pictures by wire.

1889 when George Eastman sold Edison some of his first photographic film. With this new film Edison went to work in earnest, and on October 6, 1889, his motion picture camera called the Kinetograph was perfected. With it was a peep-show device, called the Kinetoscope, to watch the film. A machine to project moving images on a screen had not yet been invented.

Terry Ramsaye in his book, *A Thousand and One Nights*, has this to say about this device: "It is provable that there is not now and never has been subsequent to the year 1888 any motion picture film machine whatsoever of any relation to the screen art of today that is not descended by traceable steps from the Kinetoscope."

At last the motion picture was a reality. The first art dependent on mechanical means was in existence. Mr. Ramsaye had little knowledge of television (1926), and although his words were true then, they must be modified today. For one year later in 1927, a Scotsman, John L. Baird, recorded living images on a phonograph record, dispensing with need either for a motion picture camera or for motion picture film.

The "Edison Effect"

Another of Edison's discoveries was to have great influence upon the electrical world. This was his discovery in 1883 of what was to become known as the "Edison effect." This led indirectly to the invention of the electron tube or thermionic valve. While experimenting with his electric light bulb, Edison noticed that the inside of the bulbs became blackened by a dark deposit on the glass. While trying to find the cause of this phenomenon he discovered that current would flow from the heated element to a conductor placed anywhere in the bulb, but he was so busy that he never continued work on this effect. This was actually the basis of the vacuum tube. Before the vacuum tube and its resultant amplifiers, early pioneers in television were able to get only superficial results.

One of the earliest pioneers was George R. Carey of Boston. In 1875 he devised a simple method of transmitting a picture as a unit (Fig. 1). He proposed to set up a wall or mosaic of selenium cells, each cell to be connected by a wire to a corresponding lamp in another bank or mosaic. In theory, as each selenium cell was illuminated by part of the picture, it would transmit a current or corresponding signal to its lamp on the mosaic. The picture would correspond to the number of dark and light elements in the picture. This apparatus was limited by the number of cells and lamps that could be placed in a mosaic. Carey was hindered also by the poor quality of the selenium cells of his day and by the lack of a suitable amplifier to strengthen the weak signals.

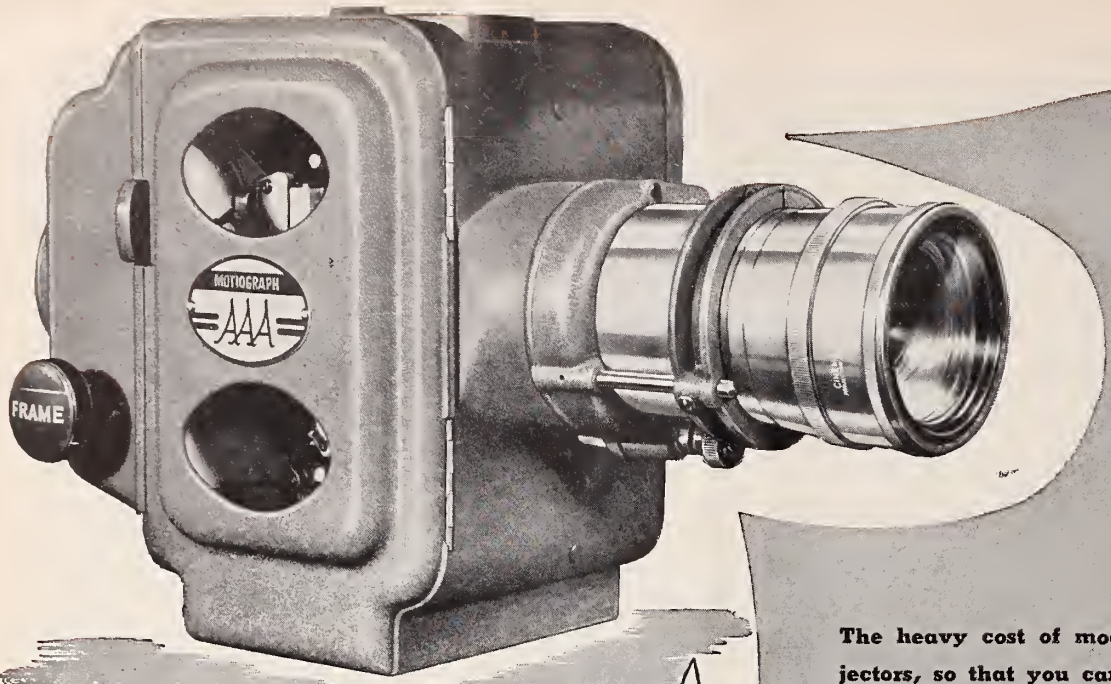
A more important pioneer was Paul Nipkow, an engineer, who invented a television machine in 1884. This was some five years before Edison invented his motion picture camera. So in theory, the television camera was conceived before the motion picture camera.

Until Nipkow's time, men like Carey

† This article originally appeared as a chapter in *Electronic Motion Pictures*, by Albert Abramson, University of California Press, Berkeley and Los Angeles, Calif., 1955.

* *A Thousand and One Nights*,, *A History of the Motion Picture*, by Terry Ramsaye, Simon & Shuster, Inc., New York, 1926.


Through the keyhole
. . . and how Alice got there
How to treat a body as so much smoke . . . thread it through a keyhole . . . materialize it as a living, breathing human being. A trick of course . . . compounded in optical and processing departments to confound and charm the public . . . developed by an industry that never fails to entertain. To aid in solving problems such as this, Kodak provides Eastman Motion Picture Film for every purpose . . . maintains the Eastman Technical Service for Motion Picture Film.
Motion Picture Film Department
EASTMAN KODAK COMPANY
Rochester 4, N. Y.
Divisions at strategic centers. Inquiries invited.
East Coast Division
342 Madison Avenue
New York 17, N. Y.
Midwest Division
130 East Randolph Drive
Chicago 1, Illinois
West Coast Division
6706 Santa Monica Blvd.
Hollywood 38, California



Why It's Just Good Business To Install Motiograph AAA PROJECTORS Now!

The heavy cost of modifying your old projectors, so that you can play all prints, use latest type arcs, and avoid film damage, is ample reason for purchasing new Motiographs without further delay.

★ **PROJECT ALL TYPES OF PRINTS**—standard, CinemaScope, or combination optical and magnetic—without interchange of sprockets, rollers, shoes or tracks.

★ **CORRECT WORKING DISTANCE BETWEEN APERTURE AND MIRROR** with any make or model lamp including the new, big reflector arcs.

★ **MAXIMUM SCREEN ILLUMINATION.** Best center to side light distribution.

★ **AIR AND WATER COOLED GATE AND FILM.**

★ **ROCK STEADY PROJECTION.** Silent operation.

Now, more than ever, your projector dollars go farther with long-life Motiographs. There are no other projectors like them.

Your Motiograph dealer will gladly serve you. He has a liberal financing plan. Write today for literature.

Motiograph, Inc. "SINCE 1896"

4441 W. LAKE ST., CHICAGO 24, ILL.

Export Division (Except Canada): Frazar & Hansen, Ltd., 301 Clay Street • San Francisco 11, California

PROJECTORS • SOUND SYSTEMS • IN-CAR SPEAKERS • GENERATORS

had devised ideas of sending pictures over wires as a unit. Nipkow realized how improbable this was. He decided to dissect a given scene into its dark and light values and transmit these values in orderly sequence. Thus was born the scanning principle which is still the only practical means of transmitting a picture from one place to another by electrical apparatus. These dark and light values were to be converted into electrical voltages. These voltages or signals would vary in proportion to the amount of light applied. They would be then sent in sequence by wire to a receiver where they would be reassembled as a complete picture.

Nipkow's Disk

Nipkow proposed to do this by means of a revolving disk which was to have a series of holes perforated in a spiral near the outer edge. Behind this disk was to be a light-sensitive element such as the selenium cell shown in Fig. 2. It would receive the light from the subject and transform it into a modulated current. The stronger the light, the stronger the current that the cell would send out. The less light, the smaller the current or weaker the signal from the selenium cell.

The signals or modulated current would travel through a wire to a receiver. It would have a perforated disk similar to the one at the transmitter. Behind the disk a special piece of flint glass would be used as a light-control medium. The signal currents from the transmitter were to create a magnetic field around the glass, which would vary the amount of light that could be seen through the holes in the scanning disk. Thus it would be lighter or darker depending upon the signal

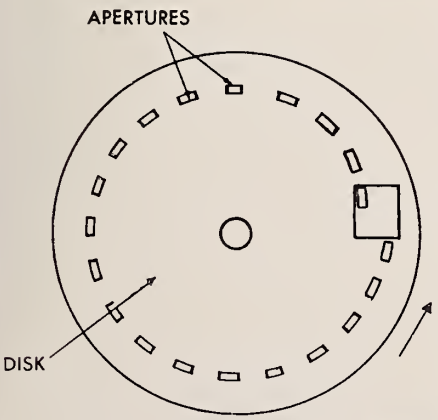


FIG. 2. Nipkow's apertured disk for scanning the picture to be transmitted by an early TV system.

received. The viewer would watch the flint glass through the holes in the revolving disk, and this would result in the reconstruction of the scene in the mind of the viewer through persistence of vision.

Nipkow's ideas were sound enough, but his tools were crude, and his mechanical system needed electrical refinements which had not yet been discovered. Selenium cells were very sluggish in their action, and he had no way to build up or amplify his feeble electric currents.

Nipkow's system of scanning became known as the "direct system" as opposed to an "inverted system" which evolved many years later. He never built his apparatus and though he filed a patent, he let his application lapse for lack of funds. His theory, however, included all the basic elements needed for a workable television system. Others, using a method of scanning based on his ideas, made it work and gave television its start.

The Mirror Drum

In 1889, the year Edison invented the motion picture, Professor Lazare Weiller proposed the mirror drum to take the place of Nipkow's scanning disk. This consisted of a series of mirrors mounted around the circumference of a wheel (Fig. 3). Each mirror was tilted at a slightly different angle from the one preceding or following it. As the drum rotated, each mirror reflected the light from a different part of the scene being scanned onto a light-sensitive element. With its greater reflecting power this was a more efficient method than the direct system using a Nipkow disk. As a result, some of the earlier outdoor scenes were transmitted by means of a mirror drum.

For many years, until the all-electronic television system came into universal use, both the mirror drum and the Nipkow disk were used in early picture transmission and reception. Crude and limited as they were, they gave television the early success that was so vitally needed and paved the way for our modern high-definition system. In addition to these mechanical inventions, there had been many discoveries pertaining to the effect of light upon certain materials. Television could not become a reality until some methods were found to convert light values into electrical currents.

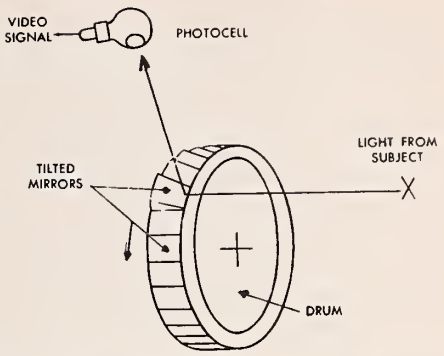


FIG. 3. The mirror drum was another early device that transmitted pictures in combination with a photocell.

These were the so-called "photo effects." They included the following phenomena:

Photovoltaic effect.—In 1839, Edmond Becquerel observed the action of light in generating an electrical current or voltage.

Photoconductive effect. — In 1873 Willoughby Smith discovered that selenium increased in conductivity when illuminated. This effect was brought to his attention by a cable operator named Joseph May. May noticed that sunlight streaming over certain apparatus had an effect upon its electrical resistance. This part of his apparatus was made of selenium, and this selenium strip offered less resistance when exposed to light than when left in darkness. This discovery seemed to be the basis of nearly all the early systems of picture transmission.

Photoelectric effect.—In 1887 Heinrich Rudolph Hertz discovered that if ultraviolet light fell on a spark gap, an electrical discharge took place more easily than when the gap was in darkness. Further work on this effect was done by Wilhelm Hallwachs in 1888. In that year he made the first apparatus for demonstrating the photoelectric effect. He observed that a well-insulated and negatively charged body lost its charge when illuminated with ultraviolet light.

First True Photocell

In 1889 Julius Elster and Hans Geitel discovered that certain electropositive metals such as sodium, rubidium, and caesium exhibited photoelectric activity when illuminated by ordinary light. In 1890 they enclosed an alkali-amalgam in an evacuated envelope and thus produced the first true phototube.

In 1875 John Kerr described what was called the electro-optical effect in

liquids. He discovered that when polarized light was transmitted through certain liquids and an electrical field was applied, it was possible to vary the the amount of light passing through so that it could be used as a light modulator or light valve. From this developed the Kerr cell which was used to regulate the light output in a number of mechanical television machines of later years.

The Cathode-Ray Tube

Developments in the cathode-ray tube were initiated by experiments with partly evacuated discharge tubes. It was soon discovered that these tubes would fluoresce in the vicinity of the negative electrode. This was investigated by Julius Plucker in 1859 and by Hittorf in 1869. Hittorf observed that when a solid body was placed in front of the cathode, a well-defined shadow was cast on the walls of the tube.

In 1876 Goldstein concluded that the rays came in a definite direction from the cathode. Sir William Crooks suggested in 1879 that this was owing to negatively charged particles. In 1897, by deflecting them by electrostatic means, J. J. Thomson proved that they carried a negative charge. Further work with magnetic fields was carried out by Sir Ambrose Fleming who showed that the image of a cross in a Crooks tube (Fig. 4) could be rotated and changed in size by changing the current through a coil wrapped around the tube.

The name "cathode rays" was given before the nature of the rays was understood. The rays were actually beams of electrons or charges of negative electricity. Crook's tube was the forerunner of the modern cathode-ray tube that is used as the picture screen in the modern television system.

Karl Ferdinand Braun perfected a cathode-ray tube in 1897 with a fluorescent screen at the end of the tube (Fig. 5). This screen was bombarded by the stream of electrons. In 1902 he showed how it could be used as an oscillograph or wave-form delineating device. Since the end of the tube would fluoresce when struck by the electronic beam, he was able to trace the path of the electrons.

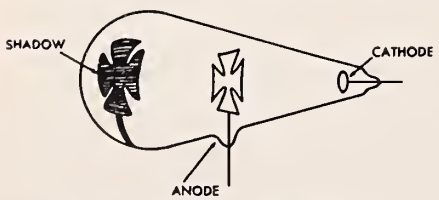


FIG. 4. Crook's tube, the forerunner of the modern cathode-ray tube.

The Motion Picture Projector

An important event took place in the field of the motion picture in 1895. This was the invention of the motion picture projector. In spite of the fact that Edison's Kinetograph had an intermittent movement, all experimenters had tried to project their images with a continuously moving film. Then, as so often happens, several independent inventors simultaneously hit upon the idea of an intermittent mechanism to allow the film to pause the time necessary for projecting a series of stationary images on the screen. They were Thomas Armat and Charles Francis Jenkins in Washington; Woodville Latham in New York; Robert W. Paul in London; and the Lumiere brothers, Louis and Auguste, in Lyons—all in the year 1895.

Edison at this time was working on a talking picture machine called the Kinetophone. This machine had the ear tubes of the phonograph of that day and was synchronized by mechanical means to his peep-show Kinetoscope. It was not successful and had a very brief life. Talking pictures were just a novelty in 1895 and were to remain so until the late 1920's.

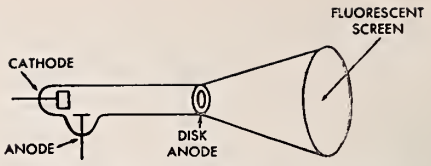


FIG. 5. Braun's tube, another step toward the development of modern TV equipment.

In 1898 the Telectroscope, the television machine of Jan Szcepanik, was described. This was to be a machine to overcome the sluggishness of selenium by use of a selenium cell in the form of a rotating disk. A pair of oscillating mirrors would scan the image and cast their reflection on the rotating selenium disk. Thus it would continually expose a fresh surface to the image. It was never built although great hopes were held out for it.

Likewise in 1899 the Danish physicist Valdmar Poulsen produced and

(*Continued on page* 32)

Elaborate New Hardtop Theatres Going Up

One very definite gauge of whether an industry is staggering on its last legs is the amount of new money being invested in it. In the motion picture field, this gauge can be translated into the number of new theatres going up, the size and elaborateness of these, and also the volume of expenditures being put into refurbishing existing theatres. Judging by some of the new ventures of 1956 thus far, the motion picture industry is still a long, long way from its last legs.

In the hardtop sphere, for example, if circuit owner S. E. Britton had a pessimistic outlook on the movie business, he certainly wouldn't have spent $750,000 to build a lavish 2,000-seat theatre in Tampa, Florida, or anywhere else. Special features of this new deluxe project which opened last month, include push-button reclining seats, a permanent theatre-TV installation, and a parking area capable of handling 2,500 cars.

Florida, of course, leads all the other states in new enterprises, yet the rest of the country cannot exactly be described as inactive. No less than $1,000,000 was spent on Sterling Theatres' recently opened 2,000-seat theatre and 35-lane bowling alley situated between Seattle and Tacoma in Washington. Southern California's San Fernando Valley will soon have a $350,000 theatre for 1,500 patrons, currently under construction by the Robert L. Lippert circuit. Not only will this project have a parking lot and a 70- by 30-foot screen, but there will also be rocking chairs in the loges.

In the outdoor sphere, erection of new theatres and improvements of old ones continue at a record pace. Theatre architects John and Drew Eberson announced recently plans for another dual indoor-outdoor project (see July IP, p. 14) to be constructed as part of a $2,000,000 shopping center at Rockland County, New York. A large number of other open air theatres are being built or planned in all parts of the country.

In examining the locations of many of the new theatres, both hardtop and drive-in, a new trend can be noticed. In a great majority of the cases, we find that new theatre sites are chosen because of their closeness to important shopping centers. Very often the theatre is the focal point of the shopping center. The advantages of such an arrangement is readily understandable. The stores attract their own customers and the theatre attracts its own customers. Yet because the facilities are so near each other, movie goers will also patronize the stores and shoppers will also go to the movies.

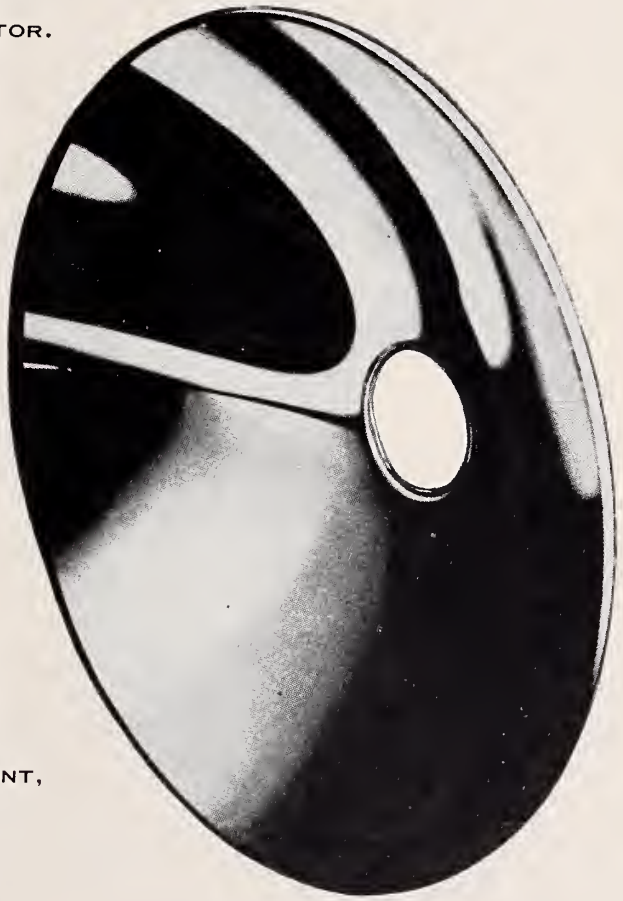


NE WAY

to brighter pictures

■ THE ONLY LIGHT WHICH CAN REACH YOUR SCREEN MUST BE REFLECTED TO IT BY YOUR LAMPHOUSE MIRROR. THE BRILLIANCY OF YOUR PROJECTED PICTURES IS DEPENDENT DIRECTLY UPON THE CONDITION OF THAT REFLECTOR.

■ SINCE REFLECTORS GRADUALLY DETERIORATE, A DROP OF ONLY 10% IN THEIR REFLECTIVE EFFICIENCY RESULTS IN A CORRESPONDING DECREASE IN SCREEN BRILLIANCY, AND ALSO REPRESENTS A WASTE OF 10% OF THE COST OF YOUR CURRENT AND CARBONS. PERIODIC MIRROR REPLACEMENT IS ACCORDINGLY A PROFITABLE INVESTMENT, THE COST INSIGNIFICANT.



Distributed by N.T.S

NATIONAL THEATRE SUPPLY
Division of National • Simplex • Bladworth, Inc.

A SUBSIDIARY OF GPE

Another bonus in screen brightness!

11% more light...

20% slower burning...

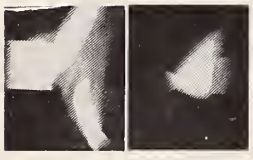


Greatly improved NATIONAL TRADE-MARK 10mm x 20"
High Intensity Projector Carbons

THE PAST TWO YEARS have seen constant improvement in "National" Projector Carbons. A new "Suprex" 7mm Carbon, "Suprex" 8mm Carbon, and now, a greatly improved 10mm High Intensity Carbon — all designed to give you more light and longer burning.

The objective of all these improvements is to provide for exhibitors the finest picture quality at lowest cost. The same leadership that has made "National" Projector Carbons outstanding over the years is still at work for you — with more new improvements to come.

Carbons are such a small part of overall cost, yet such an important element of superior projection. Be *sure* you have the best — always buy "National" Carbons.



THE PICTURE IS LIGHT...
GIVE IT ALL YOU CAN WITH
"NATIONAL" CARBONS

The terms "National" and "Suprex" are trade-marks of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY • **A Division of Union Carbide and Carbon Corporation** • ***30 East 42nd Street, New York 17, N.Y.***

SALES OFFICES: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco • **IN CANADA:** Union Carbide Canada Limited, Toronto

TESMA Maps Plans for Changing Times

By ROBERT SCHUMAN

Industry in transition period requires high-fi performance and public service to meet threats

THE sizable International Trade Show of the Motion Picture Industry was staged in a five-day presentation at New York's Coliseum. The show, comprising TOA-TESMA-PCA divisions, had a total of 225 booths and a considerable attendance turnout at the equipment section. Forums, discussion panels and meetings were held which attended to executive matters and put the stethoscope to current box office ills and problems afflicting the motion picture industry. Social activities and banquets rounded out the agenda with the usual convention conviviality.

The Coliseum's third floor was given over to equipment manufacturers' exhibits and a large food purveyors section. Interest centered around manufacturers displays and at an equipment showmanship forum where solons and engineers gathered to hold forth on the merits and demerits of movie technology. After addresses by a number of speakers, the floor was opened to questions and cross-discussion.

Forum Highlights

Ben Schlanger spoke on the new concept of the movie theatre as a place where emphasis would be directed towards the screen and the walls and accoutrements would fall away and "dissolve" in a sort of spaceless entity. Concentration would be focused on the screen without other distractions and the spectator would receive an impression of being almost in the picture. A theatre of this kind is scheduled to open in the Spring at Colonial Williamsburg. The auditorium seems to "dissolve" when the house lights go out and the wide screen is not sharply masked. The edge of the picture blends into an undefined light-colored surround area. No curtains, mural, columns, etc. exist to mar a life-like illusion.

Schlanger also stressed that the industry is heading for an era of high-fidelity presentation and that movies have got to be better than ever in order to compete. They will either become a quality medium or they will lose ground.

Earl I. Sponable of 20th Century-Fox, adduced to these remarks on high technical quality, the results of a check of some sixty theatres conducted by 20th Century. Most of them were found to have facilities below par—soundheads out of adjustment, or outmoded equipment was in use which could not possibly measure up to high-fidelity standards.

Loren Ryder of Paramount, made a similar statement in regard to prints packing high-quality values which do not show up on screens. He used this line of reasoning to oppose the idea of wider film. feeling that better projection. plus VistaVision printing process, would make it possible to get quality results from 35-mm prints even on the largest screens.

Questioned after the forum, he explained that he meant by this that poor focus and illumination of the picture fogged details that otherwise might be seen. Example—in closeups, if the picture is projected perfectly, details such as individual hairs on an actor's head can be clearly seen. However, because focus is not good enough in the theatre, such detail is lost.

Difficult Situation

Generally, a confused and uneven condition regarding new developments seems to exist. On the other hand, producers are outstripping the projectors capacity and on the other, many exhibitors have not even caught the coat-tails of the technical revolution by clinging to outdated equipment.

One aspect of this was brought out by a Texas exhibitor who complained vociferously, that after spending goodly sums to install stereo sound. he found himself virtually without magnetic stereo prints to show. He also added that the auditorium speakers were in disuse most of the time even when he did have stereo sound prints, because the companies making CinemaScope pictures seldom bothered with auditorium effects.

Sponable replied that Fox had gone as far as it could economically in making magnetic prints available to all de-



As usual a certain amount of fur flew at the equipment showmanship forum which TESMA sponsors each year during the joint convention of all sections of the motion picture exhibition industry. Present were Earl Sponable and Loren Ryder, representatives of 20th Century-Fox and Paramount Studios, respectively, who answered barbed questions from exhibitors, projectionists and others on such matters as the frequent unavailability of magnetic prints for theatres that had invested in equipment to play them.

Don Hyndman of Eastman Kodak, shown standing before the microphone, was moderator of the forum. Other panelists, pictured left to right, are: Ben Schlanger, theatre architect; A. L. Hodges and J. Eldon Peek, Theatre Equipment Dealers Ass'n; Edwin Gage and Joseph Zaro, Theatre Owners of America; M. H. Stevens, Bausch & Lomb Optical; William Kelly, Motion Picture Research Council; Don Hyndman; Lee Jones, Neumade Products; Myron Blank, TOA; J. F. O'Brien, RCA; Arthur Hatch, Strong Electric; Frank Cahill, Warner Bros. Pictures; Loren Ryder; Leonard Satz, Raytone Screen; Earl Sponable, and Larry Davee, Century Projector.

siring them, but that the demands of most exhibitors for optical prints made it necessary to keep the largest stock of this type in the exchanges. He was displeased, he said, that other producers licensing CinemaScope, did not make greater use of surround sound, but that his company was not in position to compel its use.

A possible solution to this was offered by putting both magnetic and optical tracks on the same print. These combination prints will be made available as soon as possible. Such combo prints may have regular perforations rather than the narrow foxhole type. This would eliminate the need for changing projector sprockets to use the prints as was previously thought necessary.

Another exhibitor then asked Sponable if the same situation would prevail if he installed a wide-film projection system. After investing heavily in new equipment he might find that there was little or no product for his equipment to project.

A plea was made for better theatre management with suggestions on how to improve what *Variety* has characterized as: "sloppy projection, run-down facilities, don't-care ushering, uncurbed juvenile delinquents, noisy neigbors, surly candy-counter salesgirls, kids running up and down the aisles and . . . ineptitudes up and down the line."

Don Hyndman of Eastman, acted as moderator for the forum and essayed answers to a number of questions that arose. One of them was the problem of film buckle on black-and-white prints which has particularly troubled drive-ins using high-arc projection.

Not-too-bright-future

At a luncheon meeting, Leonard H. Goldenson, President of American Broadcasting-Paramount, bomb-shelled theatre owners with the announcement that his company plans to enter picture production and to reduce the number of theatres in its chain, weeding out the smaller, non-profit making houses. This two-edged move outflanks the divorcement question in which exhibitors have asked the government to retract its monopoly ruling and allow major producers to become exhibitors once more.

It also anticipates the impending crises shaping up from color TV and acquisition of film backlogs by the networks, by knocking the small theatre out in advance. This infanticide towards its own chain by one of the largest exhibitors, has met criticism as being unduly pessimistic.

Aimed at stimulating theatre attendance is a promotion campaign which will get rolling soon to sell the movie theatre as the best source of entertainment. In conjunction, big giveaways and prize programs will be featured as well as other advertising schemes —such as a National Movie Day and theatre tours by Hollywood personalities.

A foreign film series showing was held concurrently with the convention. Foreign film companies were well-represented at the trade show, with delegations from France, Italy, England, Israel and Mexico. The foreign trend is one way of combating the existing shortage of American films.

Arthur J. Hatch of Strong Electric Corp. and Marty Wolf of Altec Service Co. New York, were elected to the board of directors of TESMA. Re-elected for another three-year term were Clarence Ashcraft, Ashcraft Mfg. Co., and M. H. Stevens of Bausch & Lomb.

The board also consists of: Ben H. Adler, Adler Silhouette Letter Co.; Larry Davee, Century Projector Corp., J. A. Fetherston, Kollmorgen Optical Corp., A. E. Meyer, International Projector Corp., V. J. Nolan, National Carbon Co., J. F. O'Brien, RCA; Erwin Wagner, Wagner Sign Service, Inc., and Fred J. Wenezl, Wenzel Projector Corp.



TESMA's newly elected board of directors, standing, left to right: Martin J. Wolf (new member), Altec Service Corp.; Clarence S. Ashcraft (re-elected), C. S. Ashcraft Mfg. Co.; Larry Davee, Century Projector Corp.; Fred J. Wenzel, Wenzel Projector Co.; Arthur Hatch, Strong Electric Corp.; V. J. Nolan, National Carbon Co. Seated, left to right: Merlin Lewis, executive secretary; Oscar F. Neu (president emeritus), Neumade Products Corp.; Lee Jones (president), Neumade Products Corp.; Thomas LaVezzi (vice-president), LaVezzi Machine Works; Fred C. Matthews (former TESMA president), Motiograph, Inc.; Ben H. Adler, Adler Silhouette Letter Co.

Not shown in the photograph are board members J. A. Fetherston, Kollmorgen Optical Co.; A. E. Meyer, International Projector Corp.; J. F. O'Brien, RCA; M. H. Stevens (re-elected), Bausch & Lomb Optical Co.; and J. Robert Hoff (honorary board member), The Ballantyne Co.

Theatre Payrolls Decline

Theatre payrolls and the number of people employed in the nation's theatres declined slightly over the past few years, according to a preliminary report of the 1954 business census conducted by the Department of Commerce. As would be expected, the figures show that the decline occurred only among hardtop theatres. There was a sharp rise in both payroll and number of employees at drive-ins. Figures and percentages were reported comparing the theatre situation in 1954 with that of 1948, the previous census year.

The report also revealed that the number of theatres in '54 was within 1% of the total in '48. A 17% drop in indoor theatres was largely offset by an almost 500% increase in outdoorers. Receipts of outdoor theatres also skyrocketed fivefold during the '48-'54 period, while hardtop receipts declined 24%. It should be noted that receipts tabulations included admission taxes which were much higher in 1948.

Coincident with the publication of the census report were the hearings of the Senate Small Business Committee airing the differences between producers, distributors, and exhibitors. At one of these sessions, Louis Phillips, general counsel for Paramount Pictures, listed the following reasons why some hardtops are finding the going rough at this time:

1. The growth of drive-in theatres.
2. The competition from television.
3. Shifts in population and the advent new residential areas, as well as the opening of large shopping centers with their own theatres.
4. Unemployment in certain areas.
5. The obsolete and run-down marginal theatres.

One of our projectionists takes a long look into the future and comes up with not-too-wild ideas of things to come.

The Shape of Things to Come

By JOSEPH HOLT
Member, Local 428, Stockton, Calif.

NOT many days ago my shift partner and I were engaging in what we would prefer to call "thinking about the future of the industry." It's a wide-open field, for we understand that persons high and low in both production and exhibition fields have some widely variant ideas as to just what will keep the paying customers coming to the box office in spite of other attractions.

But my old working Buddy and I were not especially awed by the thought that so much energy is going into devising methods of holding old customers and attracting new ones. We reflected upon the history of the industry which seems to have done very well by looking into the crystal ball, taking a wild guess on public taste, and marking time until all the talents could be channeled into the final distribution medium, the motion picture projector.

If producers have been able to please the public over the years, we reasoned, they are most likely to continue to be able to do so. However, we used our mental time machine to visualize what might be common practice in theatres everywhere some few years hence.

We paid a visit to "Hometown, U.S.A." and were shown through the entire building of the most successful theatre operating in the year 1986. Although we were impressed with the numerous improvements in patron comfort, we were naturally more interested in what went on in the projection room.

A 'Telejection' Room

The most striking characteristic of the layout was the appearance of spaciousness while at the same time equipment controls and devices were placed in such manner as to make workers' tasks easier. This condition, we learned, had been brought about by a project financed by theatrical unions and employers in which the best engineering and working projectionist experience had been pooled to design a standard "telejection room" which was in use throughout the country.

We soon found that the name "telejection room" was somewhat misleading, as most of the program material was projected from film. The name had been adopted, however, to indicate that important use of wide-view television was made at each performance.

Film projection had been retained as the most economical and effective means of bringing entertainment to large audiences, but for the special events which in the old days had been presented by means of newsreels, taped recordings of televised events had proved to offer important improvements and had therefore become standard practice.

We were told that a world-wide system of reporting news events had been set up which used electronic cameras and video tape. The resultant recording was sped to editing centers, "tightened" and cut for best interest, and then relayed to distribution headquarters for release to theatres.

We inspected the receiving room which contained a pair of three-channel video-audio recorders. Even as we were watching, one of the units which was marked "line standby" went into automatic operation while an audible warning rang to alert receiving personnel in order to verify correct recording level.

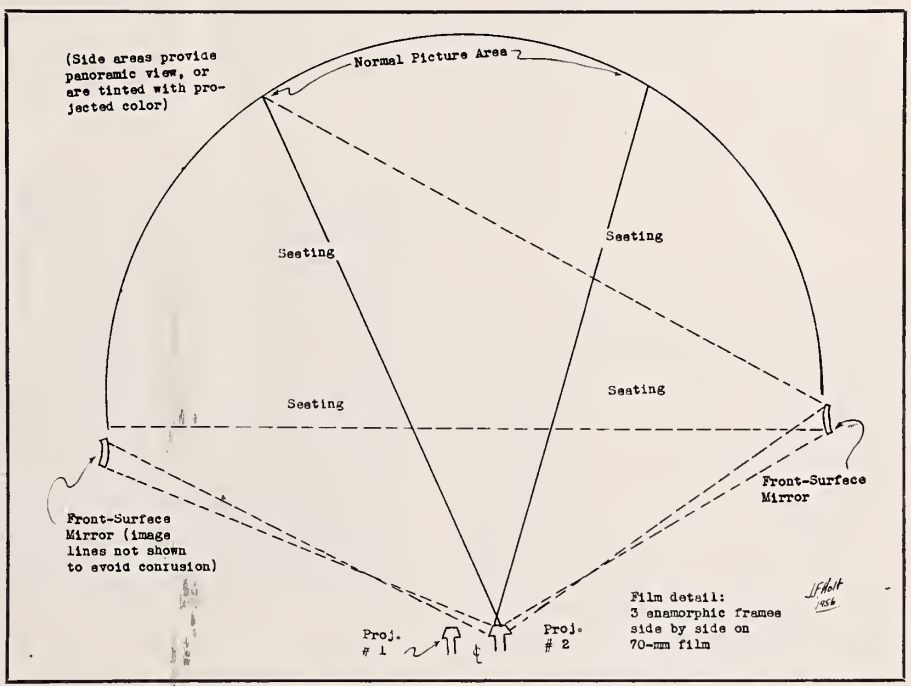
A Projection Dream

Since the recorder head was followed by a monitor playback, we were able to see the recorded image immediately after recording. "This is what we have been waiting for", one of the crew said to us.

As soon as the recorder had stopped, the tape was spliced into the previously received news footage. The other footage was the regular afternoon edition and most of the events had taken place not more than six hours previously.

The film program was nearing its end, and we were initiated into the mysteries of the tri-vision projector, which used a single unit lens and

(*Continued on page* 31)



Being a most methodical individual, our West Coast contributor rushed for pencil and paper when he finished his daydream about the theatre of the future. Here is what he got down on paper — a theatre where the customer is completely engulfed by the picture on the screen.

In The SPOTLIGHT

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

THE UNITED front of labor and management trying to solve the present problems of the motion picture exhibition industry was symbolized by the IATSE display booth at the joint trade show of the Theatre Owners of America (TOA) and the Theatre Equipment and Supply Manufacturers' Association (TESMA), which was held last month at the New York Coliseum. The booth was manned by members of New York Local 306. A number of top IA officials, including President Richard F. Walsh, were in attendance during the show.

This marked the first time that the Alliance was officially represented at a trade show of this nature, and it also was the first time that TESMA made a serious effort to attract projectionist visitors to one of its conventions. Although in the past years many projectionists made it a practice to attend the TESMA showings (generally at their own expense) and a number of them took part in concurrent activities, such as the Equipment Showmanship Forums, the welcome mat was never really rolled out for them until the recent exhibit. A sign prominently displayed at the registration desk bade projectionists welcome to the TOA-TESMA show, offering them free admission. This is just another indication, we believe, of the industry's rather belated recognition of the importance of the technical know-how of the skilled projectionist, particularly since the introduction of the new processes.

Many exhibitors visited the IA booth for information on current labor problems in the industry. In an official IA bulletin distributed at the Coliseum, President Walsh expressed the desire of the Alliance to work together with the exhibitor groups " . . . for the best interests of and to stimulate and preserve moving picture theatres." In his message he pledged IA support to the following:

1. We oppose any tax on film in any State of the United States and Canada as well.

2. We will continue to strive to eliminate entirely every Federal and local admission tax.

3. We are requesting the Attorney General of the United States to review the divorcement act now in vogue with the further intention of proving many aspects of this enforcement that have been detrimental to the industry, as a whole, and theatres in particular, affecting business in general.

4. We are opposed to the indiscriminate making and taking of motion pictures in foreign countries in such large proportions that theatregoers may not agree with the type and nature of these motion pictures which ultimately lead them to remain away from motion picture theatres in America.

5. We will cooperate with you to assure the best services of motion picture machine operators through sound and projection, as well as the best services to all our employes to make moving picture theatres a clean, wholesome and worthwhile place of entertainment to be enjoyed by all patrons, young and old.

With these thoughts expressed, I finally pledge our full support and cooperation to every industry endeavor aimed at the betterment of the industry and those who work in it.

• Elmer Badertscher, member of Local 248, Dayton, Ohio, since 1918, was presented with a life membership card at the Local's October meeting.

• A Superior Court ruling set aside the injunction obtained last Spring against Local 223, Providence, R. I., which prohibited the Local from picketing a drive-in theater in its jurisdiction. The Court held that the Local was within its rights in picketing the nearby Lonsdale Drive-In Theatre in an effort to organize the projectionist employees it considered eligible for membership.

• In keeping with established practice of the past six years, members of Projectionist Local 330, Fort Worth, Texas, have once again volunteered their services to the United Fund by taking complete charge of all screenings of the special charity film, which is an important part of the Fund's campaign. R. C. Sparks, business representative of the Local, estimated that there would be about 200 showings of this film before various organizations during the campaign.

• Reports reaching this corner advise us that Famous Players plans to reopen several of the Vancouver houses it closed down several months ago.

• The recent "New Horizons of '56 Show" at the Pan-Pacific Auditorium, Los Angeles, featured a tribute by Paramount Pictures to the West Coast IA



IA booth at the recent TOA-TESMA trade show held at the New York Coliseum. Seen here are members of the Alliance on hand to answer all questions relative to IA policy. Left to right: Sam Zinner, Local 306, New York City; Wm. H. Ingram, Local 253, Rochester, N. Y.; Charles Gale, Joseph Andriola, Local 306; George H. Walter, Local 686, Canal Zone; Herbert Marker, Local 164, Butler, Wis.; Philip (Blackie) Bordonaro, secretary, District No. 4, Tarentum, Penna.; Clyde Cooley, Local 343, Omaha, Nebr.; Sam Schlecker and M. D'Inzillo, Local 306.

motion picture crafts that took part in the making of Cecil B. DeMille's production of "The Ten Commandments." The tribute was in the form of a display showing the work of the various crafts employed in this production. The overall purpose of the "New Horizons" show was to call attention to the growing cordial relations between management and labor.

• We were glad to learn that Joseph Nuzzolo of Local 182, Boston, Mass., has recovered from his recent indisposition and has returned to his job at the Boston Theatre where the Cinerama feature, "Seven Wonders of the World," is holding forth.

25 Years Ago—October 1931

• The General Executive Board convened at the Vancouver Hotel, Vancouver, B. C. . . . The Indiana State Association was reorganized under the title of "The Indiana State Legislative Organization." L. P. McGirr, member of South Bend Local 496, was elected secretary-treasurer of the new organization. . . . In a radio address at Washington, D. C., William Green, AFL president, commented on the folly of wage cutting, and made a plea in favor of rationing available work. . . . Floyd M. Billingsley, business representative for Local 162, San Francisco, Calif., was appointed IA 7th vice-president, succeeding Cleve Beck.

• Cinerama opened at the Paramount Theatre in Seattle, Wash., with a crew of 15 projectionists.

• A record attendance marked the 42nd anniversary celebration recently of Local 351, Anacortes-Mt. Vernon, Wash. Members of nearby sister Locals and prominent industry personages were among the invited guests.

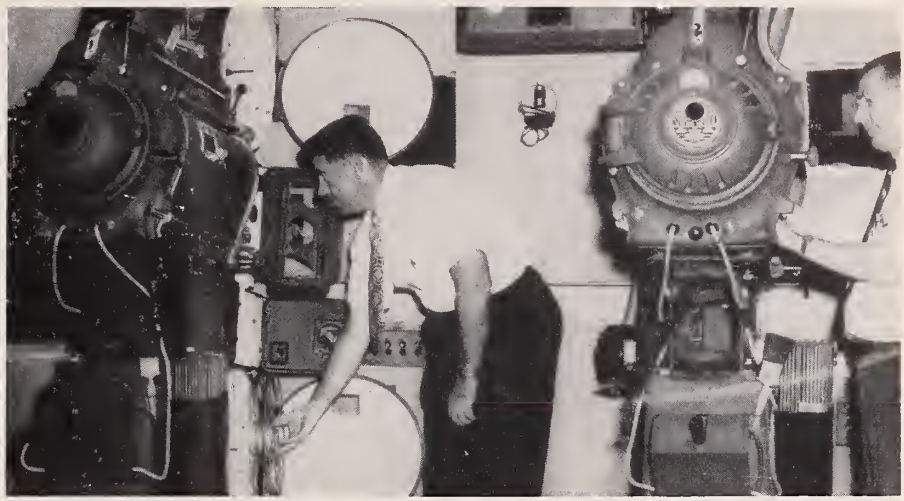
• Clyde Cooley, Local 343, Omaha, Nebr., hosted a breakfast party to the membership last month in celebration of his 18th year as secretary of the Local.

Fringe Benefits

To clear misunderstandings anent fringe benefits, the U.S. Dept. of Labor has issued the following items to be considered under that category:

1. **Paid vacations.**
2. **Holidays and sick leave.**
3. **Premium pay for overtime.**
4. **Shift premium.**
5. **Pension program.**
6. **Insurance, health and welfare plan.**
7. **Old age and survivors insurance.**
8. **Unemployment compensation.**
9. **Workmen's compensation.**
10. **State temporary disability insurance.**

Projection Work at VA Hospitals



The high projection standards of non-commercial theatres such as those operated by the Veterans Administration can be judged from the pictures above, taken recently at the Veterans Hospital in Northport, Long Island, N. Y. Projectionists are shown threading up and adjusting an arc lamp in the efficient modern projection room.

MANY projectionists who closely follow developments in the commercial motion picture industry are not aware of the rapid growth of non-commercial movie circuits operated by the Federal government. An ideal example is the circuit operated by the Veterans Administration in 176 hospitals. Civil-service projectionists are employed.

Of these 176 hospitals in this government circuit, 111 have 35-mm projection equipment comparable to commercial installations. At all hospitals, 16-mm films are presented in the wards to entertain patients. The VA has a priority on the latest Hollywood films on a pre-release basis, so that movie fare is continually fresh and reaches this incapacitated audience before it is generally available to the public.

Typical Employe

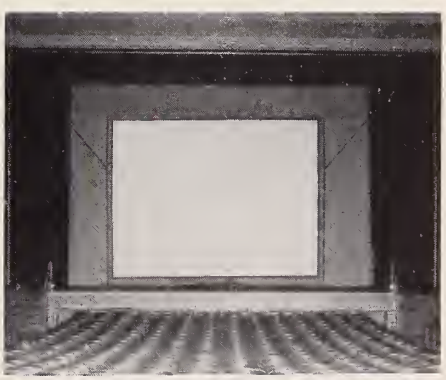
A fairly typical VA theatre is the modern 500-seat installation at a VA hospital in New York City. Projectionist Jack Glaser, a young civil-service employe holding a projectionist's license, is in charge here. Glaser received his training in the Navy where he was sent to a projectionists' school. His present pay is about $2.10 an hour, and his work schedule usually includes five feature shows a week in the hospital theatre as well as extra 16-mm work.

He tends the theatre projection room alone, manning the two Century projectors, inspecting and rewinding film, making splices and handling regular maintenance chores. He runs many of the 16-mm showings in the wards with the help of volunteers from veterans fraternal organizations whom he trains to operate the portable equipment. All in all, Glaser is kept pretty busy. He wishes, for instance, that he had a two-man projection room as in commercial theatres.

To qualify for his position, Projectionist Glaser had to take a written and practical civil-service examination. The practical test included splicing, threading up and striking arcs. In these tests the examiners many probe the extent of the applicant's knowledge by planting booby traps on the projector such as wrong aperture plates and broken sprocket teeth.

After passing his exam, the applicant goes on a regular civil-service waiting list, and gets preference if he, himself, is a veteran. The VA is especially considerate toward a disabled veteran and may even hold a special exam for him when regular lists are closed.

In the VA setup the projectionist has to be not only a craftsman but also something of a public relations man. As a member of the hospital's recreation staff, he has to use practical psychology.



The large theatre for patients at Northport Veterans Hospital accommodates more than 500 viewers. The only old-fashioned note is the 1.33 to 1 aspect ratio of the screen.

Technician's Viewpoint . . .

A monthly department that explores new ideas and current problems affecting projectionists.

EVER stop to consider the antiquated projection and sound equipment still in extensive use? For instance, how many old "regular" projector mechanisms are still grinding out reel after reel, day after day, year in and year out? And what about those clumsy old rattletraps known as "universal bases"? You'll find thousands of them with their original soundheads in theatres of all types and sizes. Even many medium-size theatres are projecting widescreen pictures with "simplified" high-intensity lamps of low amperage!

Believe it or not, at least a few dozen Powers mechanisms are still rolling footage in branch-village "picture halls" —projectors that were veterans even in the heyday of silent-film sheiks and vamps! At last report, a pair of Motiograph 1A's have never missed a show since their manufacture in 1908. Neither are low-intensity arcs completely extinct. In more than one obscure backwoods "opera house" relics from the low-intensity era are still sputtering hotly—and dimly.

With so much old equipment still in use—and any equipment made prior to World War II must be considered old, —is it any wonder that the projection troubles of decades ago are still with us? Imperfect takeup action, for instance, or picture sidesway (magnified 2 times by CinemaScope and SuperScope anamorphics).

Irregular film takeup in the old "regular" projectors is a sure indication that the lower-magazine takeup assembly needs cleaning and possible readjustment. Fortunately, this assembly is simple in construction and easy to take apart and put together.

Maintenance Methods

One particular annoyance that should be mentioned is the liability of the knurled split locknut to breakage. To be on the safe side, the projectionist should order a couple of extra locknuts of the type he is using. (The takeup shaft, or spindle, has a thread no standard nut will fit. In an emergency, tighten an ordinary radiator hose-clamp over the broken nut.)

Examine the takeup belt first thing. Make sure that it is strong, clean, and tight—as tight as possible. The belt should never be allowed to slip on the pulleys! Take a good look at the belt hook to assure yourself that there is no danger of the hook pulling out. If the belt appears to be rotten (good leather is hard to come by these days), put a new belt on the machine.

Save yourself a lot of trouble by "prestretching" new belting. Order an adequate length in advance—don't wait until both belts are ready to fall apart. Then hang the new belting up by one end with a heavy weight attached to the lower end.

To pierce a new belt for the insertion of a hook, don't use a sharply pointed awl, but *drill* the holes with a fine drill after flattening the belt ends in a vise. Upon completion of the splice, round the flattened ends again by means of pliers.

Remove the locknut which holds the tension spring in place, then pull out the reel spindle and completely disassemble the unit. Clean hardened grease and grimy oil from all the parts, with special attention to the friction-flange disks. *Do not use sandpaper or other abrasive on the flange surfaces!*

Wipe excess oil from the leather friction disk and wash it in carbon tetrachloride or Carbona. Squeeze out the fluid; and when the leather disk is thoroughly dry, dress it by rubbing a tiny amount of neat's-foot oil or vaseline over both sides, wiping off any excess.

Film Footage Increase on TV

The sibling relationship between TV and motion pictures is shown by a recent survey which revealed that 65% of all TV programs in the Los Angeles Area are on film. In New York and other major centers, where there is considerable scheduling of feature films the percentage is equally high.

With the recent purchase of MGM's feature film library of more than 725 films, WCBS now possesses a library of more than a thousand pictures never before shown on New York Television, according to Hal Hough, program director. The library also includes 152 pictures from Warner Bros. and 104 pictures acquired from Columbia.

Picture projection has now become a staple for TV revenue and programming with more than half the shows being projected out on film.

Apply fresh projector oil to the spindle shaft and reassemble the takeup. Introduce a few drops of oil into the bearing oil-hole. Then adjust the takeup tension with the knurled nut which regulates the pressure of the spring against the movable flange-disk turned by the three pins.

Correct Tensioning

Takeup tension must not be excessive, and yet it should be great enough to enable a fully loaded 2,000-ft. reel of film in the lower magazine to revolve when the projector motor is switched on. If the loaded reel is easily restrained from turning by pressing a finger against it lightly, chances are that the tension is about right. Then screw the locknut up against the tension-spring nut or, if a split-nut is used, fasten the screw securely.

Excess tension causes the teeth of the holdback sprocket to tear the film perforations, especially at the beginning of each reel when the roll on the lower reel has a small diameter. Insufficient tension, on the other hand, is dangerous because of the pile-up of film should the lower reel stop turning.

If the takeup unit is in good condition and properly adjusted in regard to tension, the film will wind up smoothly and evenly. *Keep the takeup assembly in good operating condition by protecting it from oil which may drip upon it from the picture mechanism or soundhead.* Never oil the friction-disk arrangement of the old Simplex-Type of takeup unit.

The foregoing remarks apply to old-style takeups of the Simplex Regular and Super Simplex types, *not* to Motiograph takeups. The older Motiograph takeups are of the friction-cone type having a cork "gripping disk." This unit must also be taken apart and cleaned whenever the takeup action is irregular or jerky.

The face of the Motiograph cork gripping disk should be kept clean at all times, as dirt interferes with proper operation. After cleaning in carbon tetrachloride, the cork disk should be soaked in fresh projector oil. A small amount of graphite is then rubbed upon the bevelled face of the cork. Adjust Motiograph takeup tension in the same way as described for Simplex projectors.

The takeups of Western Electric (ERPI) universal projector bases are usually noisy on account of the direct path of the film from the holdback sprocket (located *in* the lower magazine) to the takeup reel. Moreover, the complex mechanics of these old-time contraptions—universal joints, vertical-shaft drives, motor gear boxes, chain drives for the takeups, etc. make the job

of keeping the takeup friction-clutch assembly clean exceedingly troublesome. The transmission gear box, for example, throws out excess grease, spattering the projector base, the floor, and the back wall of the projection room when the grease gets on the takcup chain.

The "singing" holdback sprocket has led many projectionists and service engineers to assume wrongly that takeup tension in universal-base units is ordinarily too great. The "singing" can't be helped: there are no fire-valve rollers between the sprocket and the reel to "damp" the film and bring about smoother disengagement of the film perforations from the sprocket teeth.

Adjust takeup tension in universal bases in the same way recommended for other machines, and forget the noise if the teeth of the holdback sprocket aren't worn. It is definitely unsafe to have so little takeup tension that the lower reel must be started by hand when the projector is switched on.

NOW for that other topic connected with old projectors. Sidesway is a defect attributable ultimately to inadequate or improper projector design. The "range" of sidesway is limited in all projectors by the construction of the film gate and associated parts. In all of the older projectors, sidesway is *restricted* by the flanged lateral-guide rollers at the top of the gate. Mechanical stresses on the film which tend to induce sidesway are somewhat reduced by the damping action of the intermittent-sprocket shoe, although this shoe cannot fairly be regarded as a preventative of annoying sidewise movements of the projected picture.

The job of maintaining constant lateral alignment of the film in the gate, therefore, is left to the flanged guide rollers; but these are positioned rather too far from the aperture to handle this exacting task satisfactorily.

Projectionists operating on the older projectors can minimize sidesway by minimizing the alignment-disturbing stresses which continually act upon the moving film. In other words, the lateral guide rollers must be helped to do their job well.

The gate film-runner tracks must be perfectly aligned and flat; the gate-door tension pads must be flat and exert the same pressure on both margins of the film; the intermittent sprocket must be in line with the gate; the flanged guide rollers must be positioned laterally so that the guide flange (the one nearest the projectionist as he stands at the side of the machine) does not force the film into a slanted path or allow it to pass through the gate too much to one side.

The guide-roller assembly must be kept clean and *very lightly* lubricated so that the flanges revolve slowly when the film is running. The inside, or film-contacting, surfaces of the flanges should be true and flat, unscored by the edges of the film. The tension exerted by the little coil-spring upon the movable flange must be very gentle to prevent disturbance of the film loop and "cupping" of the film. Also, avoid too large an upper loop when threading, forasmuch as an upper loop so big that it flops and slaps invariably tends to make the picture unsteady.

"Studio Guides"

Additional rails to edge-guide the film —the so-called "studio guides" — are used in several modern American and English projectors to restrict sidesway. Studio guides do not *prevent* sidesway because they must be far enough apart to permit unshrunken film to pass through the gate. Theatre-release prints having various degrees of shrinkage are therefore able to move laterally in the gate. Worst of all, studio guides allow the film to "slap" every time an edge "brings up" against a guide rail. In some cases the film oscillates sidewise very rapidly, and hence conspicuously. A larger, but slower and smoother, range of sidesway is less annoying.

Studio guides also reduce the effectiveness of the flanged guide rollers. The guide rail nearest the projectionist, should, of course, be aligned with the guiding flange; but accurate alignment is a practical impossibility. Worn or grooved studio guide rails are worse than useless.

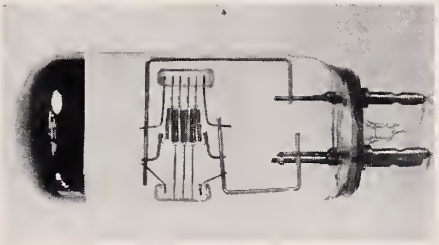
In spite of their wide use, studio guides are tabu in projectors. The only practical preventive of sidesway used to date in theatre projectors consists of *two sets* of flanged guide rollers, one in the usual position at the top of the gate and the other just below the aperture. The manufacturers of Motiograph projectors adopted this nearly perfect film-guiding construction for the Motiograph AA and AAA projectors after the use of studio guides in the model K projector failed to prove wholly satisfactory.

The use of two sets of lateral guides is one method of eliminating sidesway. Another method involves an intermittent-sprocket shoe designed to function as a second guide roller. But until all projectors are properly designed for constant lateral positioning of the film, the projectionist must "baby" his mechanisms to reduce sidesway as much as possible. For sidesway, during CinemaScope showings, is always twice as bad as when standard prints are shown in normal format.

New G-E Lamp for Low-Contour Projectors

A new tungsten projection lamp which operates on its side, yet which still makes use of a vertical filament is announced by General Electric. The horizontal operational position of the new lamp will make possible new designs of low-contour projectors. It is claimed that a vertical filament performs much more effectively than a horizontal filament. In the new GE model (see photo), the filament has been rotated into the vertical position while the lamp itself remained on its side.

Other unique features incorporated in the lamp include the elimination of the usual metal base and a golden opaque top. In place of the metal base, there are three lead wires which are inserted through a glass button and covered with metal sleeves. These sleeves, besides conducting the electricity, provide stability by snap-locking into the socket. One of the main advantages of the baseless construction is that the lamp operates with less heat. This is so because material has been eliminated which in other lamps serves to retain heat. The no-base feature also enables the GE lamp to be built shorter than existing lamps of the same wattage.



GE's horizontal lamp with vertical filament.

Focus Guaranteed

According to the manufacturer, a new assembly technique guarantees accurate focusing in the lamps, thereby assuring maximum picture brightness. The technique is said to be a simpler and less costly method of pre-focusing. (Pre-focusing is the positioning of the filament in relation to the socket so that its beam of light will directly line up with the optical system of the projector.)

The golden opaque top on the inside of the lamp to prevent chipping and scratching is for the purpose of minimizing stray light. Production of the new lamp is scheduled to begin early next year in 500- and 300-watt sizes. Manufacturers are now considering designs of low-cost low-silhouette slide and movie projectors which will utilize the new lamp.

LETTERS TO THE EDITOR

Request for Wider Coverage

To the Editor of IP:

Please find enclosed an American Express Co. draft for the renewal of my subscription. I find your magazine most useful. It contains much technical information valuable to projection technicians throughout the world.

My only objection is that IP concentrates to a great degree on projection techniques and problems current in the United States, Canada, Europe and Australia. I feel that you do not publish sufficient information regarding theatre equipment problems and projection techniques in Asia and Africa.

Speaking from experience, I can tell you that Asian countries are in great need of improved projection techniques and equipment. I strongly suggest that you arrange for some kind of representation through a correspondent at Bombay for India, Pakistan, Ceylon, Japan and Hong Kong. Discussion of Eastern as well as Western problems in your magazine would be of great benefit.

YOUSUF UMAR

Karachi, Pakistan

COMMENT: Your point is well taken, particularly when it is considered that the motion picture is the principal and sometimes the only means of entertainment or mass communication in large parts of Asia and Africa. The importance of the motion picture theatre in these areas was the subject of an editorial in the July issue of IP. In the future we plan to keep a closer eye on projection developments in the Orient, Far East, and Africa.

Curved Splice Theory

To the Editor of IP:

This refers to comments on splicing methods in IP's August *Letters to the Editor* column.

Isn't the theory behind the curved splice that it is stronger due to its supposedly providing a greater splice area than the normal straight splice?

I hope that at sometime in the future the subject of exchange film inspection (or non-inspection) will be other than "Who Shot John?"

JOSEPH J. ZARO

Bijou Amusement Company
Nashville, Tenn.

COMMENT: a curved film splice contacts film-track parts (fire-valve rollers, pad rollers, gate runners, tension pads, *etc.*) at a small angle, and for this reason is not supposed to tear apart so readily as a straight splice. Of course, curved splices must be run in only one direction; that is, with the convex side of the splice leading. If the splice area in the perforation margins lead, then the curved splice is far more likely to tear apart than a normal straight splice.

The presumed strength of the curved splice is not due to greater surface area. Compared with a straight splice having the same width of overlap—a straight hairline" splice, for instance,—curvature of the splice results in a surface-area increase appreciably less than 1%. For example, if the radius of splice-curvature is r, then the length of the curve on a film w inches wide is:

$$l = \frac{1}{90} \pi r \left(\sin^{-1} \frac{w}{2r} \right) .$$

In the case of a curvature-radius of 3½ inches and a film width of 35 mm (1.3780 inch), l = 1.3887 inch. The length or area of the curved splice is thus only 1.0078 times that of a straight splice of the same overlap-width, an increase of only 0.77%.

A comparison of "hairline" and "full-hole" straight splices, on the other hand, reveals that the full-hole, or positive-type, splice has 2.1673 times the area of the hairline, or negative-type, splice, and is therefore appreciably stronger when properly made.

Hairline splice: 1.378 x 0.072 inches = 0.0992 square inches of surface area. Full-hole splice: 1.378 x 0.156 inches = 0.2150 square inches of area. The regular full-hole positive splice has a surface area fully 216.73% that of the hairline splices. We accordingly recommend the use of full-hole splices for repairing theatre-release prints in the exchanges as well as in theatre projection rooms.

Film Lubrication Facts

To the Editor of IP:

Would you please ask Robert A. Mitchell, author of "Magnetic Tracks on Release Prints" (August 1956 issue), to read the article in the SMPE Journal, September, 1949, Volume 53, Page 285, before he submits another article?

Seattle, Wash. FRANK J. COOKE

COMMENT: The article on page 285 of the September 1949 issue of the *Journal of the SMPE* is entitled "Lubrication of 16-mm Films" and written by Ralph H. Talbot of the Eastman Kodak Co. There is, however, little connection between the subject matter of Dr. Talbot's excellent paper and the discussion of magnetic-track CinemaScope prints written by R. A. Mitchell for the August issue of IP.

For the information of readers of IP, Dr. Talbot's article describes materials suitable for the *overall* lubrication of 16-mm films. (35-mm prints are usually lubricated along the perforation margins on the emulsion side of the film only.) A number of carrier solvents for film wax are discussed, together with the precautions which must be observed in using them—the avoidance of inhaling carbon tetrachloride vapor, for instance. (Mr. Mitchell mentioned carbon tet in connection with film cleaning and stressed its dangerous toxicity.)

Slower-evaporating solutions of wax in isopropyl alcohol for use when additional film-drying space is available are described in the Talbot paper. New formulas using Freon (trichlorotrifluoroethane), a rapid-drying noninflammable solvent of low toxicity, are suggested. (Although much more expensive than carbon tetrachloride, Freon, a du Pont product, has come into use as a safe film-cleaning agent.) A suitable surface treatment for use with films to be run on automatic "repeater" projectors is described.

SCIENCE NOTES

AN UNDERWATER TELEPHONE CABLE soon will cross the Atlantic ocean for the first time, connecting Newfoundland and Scotland, covering a distance of 1,950 nautical miles. Previous cables, dating back almost 100 years, have carried only telegraph signals. Transatlantic telephony to date has been entirely by radio transmission which is impaired by magnetic storms.

* * *

A BETA RAY COLLECTING DEVICE has been developed to harness part of the energy released in a nuclear reactor, following which the energy may be used for electrical power. The device extracts beta rays directly from the reactor through terminals. About 7 to 10% of a nuclear reactor's power is in the form of beta rays which ordinarily are dissipated as heat.

* * *

THE FASTEST STOP WATCH, an electronic tube timing atomic events down to a *billionth of a second*, was announced by the Westinghouse Research Laboratories. It is claimed that the new "watch" may be even 10 times faster than this.

* * *

A TRANSISTORIZED AUTO RADIO will appear in the Chevrolet Corvette this year, according to General Motors Corp. New transistors are said to provide the radio

with one-third more power, less distortion, wider tonal range, elimination of vibrator buzz, and lower current drain. Motorola, Inc., has announced the first commercial transistorized portable two-way radio.

* * *

A NEW TRANSISTOR-MAKING technique has been developed by Westinghouse to build transistors capable of extremely high frequency operations. Another item known as a photodiode, which is a special transistor, is reported to be 10,000 times more sensitive to light than conventional photocells, yet can control 100 times more current.

* * *

A WIRELESS THERMOSTAT which can automatically control a heating system, open doors, and cook complete meals via radio signals has performed experimentally at the Minneapolis Honeywell Regulator Co. The thermostat operates on the principle of converting sound impulses into energy.

* * *

SOME ALUMINUM ALLOYS resist corrosion for at least 20 years, according to an investigation by the National Bureau of Standards. The study also provided data regarding the effects of heat treatment and protective coatings on the corrosion rates of various aluminum alloys.

* * *

EXTENDED TV BROADCASTING throughout the nation was predicted as a result of an RCA experiment that produced *4½ million watts* of ultra-high-frequency TV radiated power at a frequency of 537 megacycles. This is the highest continuous-wave power ever achieved at that frequency, and more than four times the output of the most powerful existing UHF TV stations.

* * *

A DRY ENLARGER capable of reproducing 15 standard-size engineering drawings a minute from microfilm originals has been developed by RCA.

* * *

AN X-RAY INTENSIFYING SOLUTION was successfully used to strengthen weak X-Ray images in order to locate a blood vessel leak in an 11-year-old boy's hand. The new DuPont product builds up the density of weak silver images by changing its chemical composition.

* * *

AN AIRBORNE DIGITAL COMPUTER, using transistors instead of vacuum tubes, has been successfully developed for the Air Force. The miniature computer, only 3 cubic feet and weighing 125 lbs., uses 1,000 resistors, and is said to be able to solve the same mathematical problems in one second's time that would take an engineer nine hours with pencil and paper.

SUPER SNAPLITE
f/1.7
and
SUPER SNAPLITE
f/1.7X

(True speed of f/1.7 in all sizes where fast lenses are needed)

NOW . . . FINER LENSES FOR FINER MOTION PICTURES



From Kollmorgen . . . the newest, fastest projection lenses you can buy. To give you the brightest, clearest, sharpest, most uniform picture you have ever seen on your screen. For better Boxoffice, better patron satisfaction, better all around filming, try the SUPER SNAPLITE f/1.7. Where lens mount interferes and vignetting is a problem, try the SUPER SNAPLITE f/1.7X.

True speed of f/1.7 in focal lengths from 2 inches through 4 inches in ¼ inch steps. Ask your Theatre Supply Dealer about these fine lenses. For more information ask your dealer or write for Bulletin 222.

KOLLMORGEN Optical CORPORATION
NORTHAMPTON, MASSACHUSETTS

PERSONAL NOTES

LEONARD H. SOLOMON has been appointed general manager of the Golde Mfg. Co., Chicago, producer of slide



L. H. Solomon

projectors, projection accessories and spotlights. Before joining the Golde organization, Solomon was with the Mitchell Mfg. Co., also of Chicago, for 10 years, most recently as manager of their electronics division. Previous to that, he was associated with Excel Movie Products.

* * *

BURT ENNIS, director of publicity for the Altec Companies, has taken on additional duties whereby he will divide his time between the New York office of the Altec Service Co. and the manufacturing plants of the Altec Lansing Corp. on the West Coast, which produces both motion picture sound equipment and quality "Hi-Fi" amplifying systems for home use. Ennis joined Altec in 1953 to promote the introduction of stereophonic sound in conjunction with Cinerama and CinemaScope. He was formerly a publicity executive for various major studios in Hollywood, and at one time conducted a column in the Los Angeles *Herald*.

* * *

DON ATKINSON, National Theatre Supply salesman for the past ten years in the Virginia and Washington, D. C., territory, has been appointed manager of the NTS Baltimore branch, the company announced recently. Atkinson succeeds N. C. HAEFELE, veteran equipment representative, who retired recently after 30 years' service with the company spent in the Baltimore area. Atkinson started his career with National in 1936 in the Detroit branch and has served in various capacities continuously since that time, except for a four-year stint in the Army during World War II. JAMES BARHAM, formerly of Greensboro, N. C., has assumed the NTS sales job for Virginia and will headquarter in Richmond.

* * *

CLARENCE L. A. WYND and LOUIS K. EILERS have been elected vice-presidents of the Eastman Kodak Co. Wynd is assistant general manager of the company's Kodak Park works. Eilers, who is presently a Kodak Park assistant general manager, has also been named an assistant general manager of Kodak.

Wynd joined Kodak in 1927 as a chem-



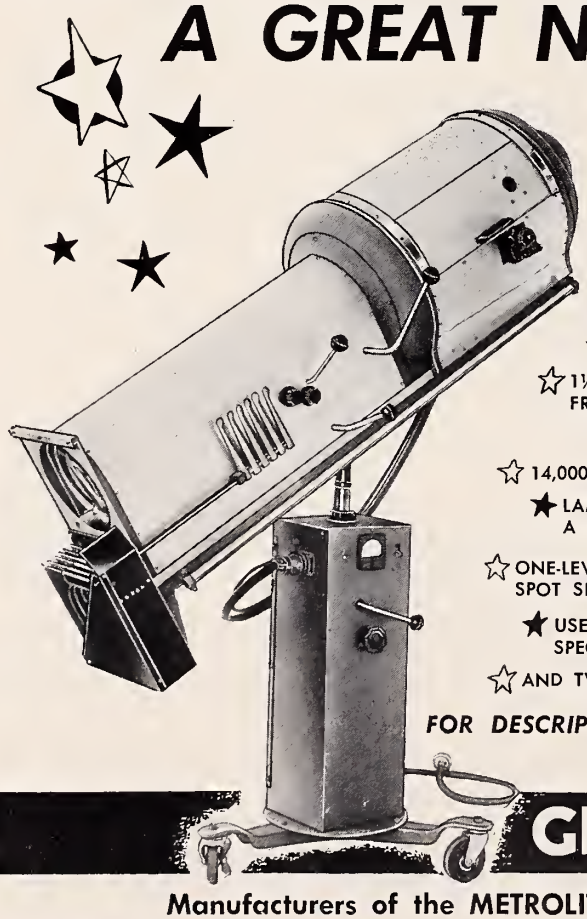
Clarence L. A. Wynd



Louis K. Eilers

ical engineer in the roll coating department at Kodak Park and became assistant general superintendent of the film manufacturing division in 1944. He became assistant general manager of Kodak Park in 1953. Eilers joined Kodak in 1934 as a chemist at Kodak Park where he was in charge of a research unit on cellulose esters manufacturing.

A GREAT NEW SPOTLIGHT



designed by GENARCO INC. is now in production with these outstanding features:

- ☆ NEW PRINCIPLE CARBON ARC LAMP. THE RESULT OF YEARS OF RESEARCH FOR THE U.S. GOVERNMENT GIVES TWO TIMES MORE LIGHT THAN CONVENTIONAL ARC LAMPS, BECAUSE IT USES THE LIGHT OF *BOTH* CARBONS.
- ★ COMPLETELY AUTOMATIC AND SELF FOCUSING ARC LAMP.
- ☆ 1½ HOURS OR 2 HOURS OPERATION WITHOUT RECARBONING, FROM A CONVENIENT 115 VOLTS AC OUTLET.
- ★ LARGE 16" DIAMETER REFLECTOR FOR HIGH LIGHT OUTPUT.
- ☆ 14,000 LUMENS TO FLOOD THE STAGE OR THE ARENA.
- ★ LAMPHOUSE, REFLECTOR AND MECHANISM KEPT COOL AND CLEAN BY A BLOWER.
- ☆ ONE-LEVER SPOT SIZE CONTROL WITH MAXIMUM LIGHT OUTPUT FOR EVERY SPOT SIZE.
- ★ USE OF *MIRACLE* MATERIALS: SILICONE BASE PRODUCTS, ULTRA INSULATORS, SPECIAL ALUMINUM ALLOYS, ETC. . . .
- ☆ AND TWELVE OTHER EXCLUSIVE FEATURES

FOR DESCRIPTIVE PAMPHLET ON THIS MODEL AC.3 SPOTLIGHT, WRITE

GENARCO INC. 97-04 B SUTPHIN BLVD. JAMAICA 35, N. Y.

Manufacturers of the METROLITE, the world's most powerful spotlight

Memories of a Crazy Nickelodeon

We are indebted to *Variety* for this humorous account of a projectionist's work at a small-town theatre back in 1913.

By PAUL GORMLEY

EARLY Nickelodeons rejoiced in such names as Star, Unique, Gem, Cozy, Electrica. I manned the crank of a rackety Powers projector in the stifling booth of the old Star theatre in Morrisburg, Ontario. This burg on the banks of the St. Lawrence River is now doomed, like several of its neighbors, to disappear beneath the swelling waters of the St. Lawrence Seaway development. So my old Star grindhouse will eventually be under water, strictly for pickerel.

Before it opened in its own building on Main Street, across from the post office and next door to the weekly newspaper and the hardware store, in 1913, the Star was on the second story of a side street, reached by a flight of wooden stairs. The program was two-reel Westerns, interspersed with song slides accompanied by the house manager on his melodion (a piano ancestor) and his raspy tenor.

In the new, more stylish building, the Star was on the ground floor with a second-floor apartment for the manager. The floor of the theatre sloped so the backrow patrons could see partially over the heads of the people in front of them. Difficulty was, the kitchen chairs, tied together by planks nailed under them, sloped with the floor and the unwary customer usually found himself sliding. He got some restraining help from the odd nail that sent its point up through the seat but he could not count on that.

The Audience Roughed It

The slanting floor came in handy for the Saturday matinee moppet trade who sent pop bottles clattering from rear to front, banging against the chair legs all the way. Another way the kids passed dull moments—when the commercials on slides came on the screen while the projectionist changed reels, for instance—was (in winter) to toss gum on the red-hot sides of the pot-belly stoves that heated the Star. This the management tried to counteract by adding coffee grounds, but the result was even worse and the strategy was discontinued.

Except on Saturday nights when the farm population came to town to do the week's shopping, visiting and funning, Morrisburg's Main Street, where the Star nickelodeon held forth, died early in the evening. By nine o'clock a cannon blasting down Main Street would have hit only a stray cat. But around 10:30 p.m., when the Star shuttered for the night, the customers stirred the street briefly as they walked home. Cars were few and distances were short, so they walked.

It was a unique trip from the main floor to the Star's projection room: a dark, closet-like storeroom, then up a ladder pinned to the wall, through a small trap door, through another small rewind and repair room, along a plankwide catwalk and into the projection room. This area was about five feet high and only big enough to accommodate one projector. That was the old Powers mounted on a wooden frame, operated by hand.

Double-Duty Lamphouse

Its lamphouse slid on tracks to project the slides that announced the coming programs and advertised the local merchants' wares. This took place while the operator changed reels. The Powers had 1,000-foot magazines and with only one machine, there was a wait every 10 or 15 minutes. When he had shown all the slides there were, the projectionist slid the lamphouse into slide position and the screen exhibited a white spot, sometimes creased by a purple line from a cracked condenser lens.

The only booth ventilation was a two-foot-square window that opened into the outer lobby so, if breathing were to be a regular thing, the door of the booth was kept open. This allowed the clatter of the Powers to sift into the theatre and join the clank of rolling pop bottles, chatter of the patrons and the doubtful music of the player-piano up under the linen screen.

Morrisburg at the time had a population of around 1,100 people, so the Star's 200 seats were usually adequate. The Star ran one show a night plus Saturday matinee. Starting time was 8:30 p.m., but frequently the deadline passed without the screen lighting up.

Sometimes the manager held the beginning of the show until he had a good-sized audience or until a favored customer arrived. There was one evening when 8:30 came and went and nobody at all arrived. Nine o'clock found the Star still empty. A few minutes after nine, the manager, standing in front where it was cooler, saw a trio of regular customers definitely heading for the show, so he called up to the projection room: "Somebody's coming. Start with the third reel—we'd of gone through the first and second by now anyway!"

A Wandering Mind

Sending Lloyd and Chaplin and Percy Marmont onto the screen by cranking the Powers by hand was monotonous. If my attention left the projector and centered on what was happening on the sheet up front, I would absently crank too slow and what was supposed to be exciting action became slow motion. It was also a problem to keep the humming carbons properly nosing each other; a hand operation, too.

The Star ventured briefly into vaudeville in the 1920's when it booked an itinerant magician and constructed a shaky platform under the screen as a stage. First night, during a stint where the magico sliced an apple on a stooge's head with a long, razor-sharp sabre, the Star as a vaudeville house died. The sabre swung a fraction of an inch too low and scalped the stooge, a local lad. Second night the audience was nil, the act folded and left town, and the Star reverted to its more comfortable film policy.

Safety Film Cleaner Produced

A chemical compound originally developed as a refrigerant, is claimed to be both safer and more efficient as a cleaner for magnetic sound-recording film than solvent now commonly used, according to the Du Pont Company.

The chemical, known by the gargantuan name of Trichlorotrifluoroethane, is called Freon-113 under its trade-mark. Its advantages allegedly are its relative non-toxicity and the fact that unlike many commonly used solvents, it will not soften the magnetic sound stripe or cause warping of the film base.

Under vigorous laboratory conditions, common solvents, it is reported by Du Pont, caused sufficient softening of the sound stripe to affect its adhesion to the film base, resulting in peeling when the film was unreeled. Some solvents also showed a tendency to remove coloring incorporated in certain types of magnetic recording film.

From a safety viewpoint, the Du Pont film-cleaner is said to be both non-toxic and non-inflammable.

Kodak Scientists in Europe

Five scientific reports were presented last month by Eastman Kodak scientists at the International Conference for Scientific Photography in Cologne, Germany. The papers, which concerned chemical developments in both black-and-white and color emulsions, were presented by Dr. Burt H. Carroll, Dr. Wesley T. Hanson, and Dr. Julian H. Webb.

Ray Brian—"Movieana" Archives, XII

Here is another stanza in the epic of the old movie projector which has been running serially in IP. These nostalgic old names and photos (such as are available) of the often cantakerous but fascinating pieces of machinery that were considered mechanical marvels back in the era of the "Perils of Pauline" and the Keystone Cops, have the same kind of magic to many people as collecting and restoring old cars. We see history repeating itself in these old machines—sound projection was tried back in the days of Edison, wide screen had its applications before CinemaScope and curved gates have appeared on some of these hoary old-timers.

Ray Brian's collection from all over the world is a unique museum of movie history. a fund of lore for antiquarians or anyone interested in the evolution of today's projection equipment. Ray Brian is constantly trying to expand and round out his collection with old photos, data or other missing links in the chain of projector development. Readers are invited to supply such information if they have it, by communicating with IP's editorial office. In the listing that follows, an asterisk at the end of an item signifies that photographs of the particular equipment named have not been located as yet. These are particularly desired.

VITOPTICON—1900*
VIVATARG—Shooting gallery projector—1916
VIVENDOGRAPH—About 1900*
VIVIOGRAPH—made by Vever in 1900*
VIVRESCOPE—about 1900*
VULCAN—made in England by Ruffell—1912.
WALTURDAM—made in England—1948.
WARWICK—made in England—1908.
WATERSCOPE—made about 1900*
WEBER—"Syncrofilm"—Weber Machine Co. Rochester, N. Y.
WESTAR—English version of the "Century".
WESTERN ELECTRIC—portable—about 1930.
WENZEL "ACE"—Wenzel Projector Co. Chicago.
WONDERSCOPE — Eberhart Schneider—1896*
WORLD EMINEX—made in Japan—1953.
WORLD PHOENIX—made in Japan—1953.
WRAY—Riley Bros.—York, England.
WRENCH—made in England by John Wrench and Sons, 1910.
X-OGRAPH—made about 1900*
ZAR—made in England by Cinema-Halles Ltd. 1915.
ZEOPTROTROPE—made about 1900.*
ZENITH—Joseph Granz, 1919.
ZEST—made in Germany.
ZINEMATOGRAPH—made about 1900.*
ZIX—made in 1920.

RCA Gets Service Contracts

Military contracts have been awarded to RCA Service Co. for the servicing of sound motion picture equipment for two branches of the Government. The organization will be responsible for the repair of 16-mm equipment used aboard U.S. Navy ships reporting to New York. Included in this equipment is RCA, Bell & Howell, DeVry, and Ampro.

In addition, RCA will inspect and maintain 35-mm projection and sound equipment as well as radio receiving and voice transmission equipment now installed at 145 Veterans Administration hospitals throughout the country. These will be serviced through the organization's nationwide district offices.

Altec Handling Todd-AO Sound

The Altec Service Co. has been placed in charge of sound equipment installation at additional theatres where the picture "Oklahoma" will be shown in the Todd-AO process. Installation of six-track sound reproducing systems for Todd-AO was recently completed at the Lyric Theatre in Indianapolis and at the Saxon Theatre in Boston. Altec technicians worked with Todd-AO equipment from the start and handled the original installation at the Rivoli Theatre in New York City.

Technical Meeting In Italy

The eighth International Congress of Cinematographic Engineering was held in Turin, Italy. October 1-3. An important topic of discussion was the use of color in motion pictures.

Fabulous New Film Cement

It was announced that a revolutionary new type of film cement for all 16- and 35-mm film has been developed by a leading laboratory. The ability of this cement to prevent splices from pulling apart and peeling far surpasses anything previously tested. A limited amount has been relecsed for consumer use exclusively to

FLORMAN & BABB
Movie Equipment Distributor
68 West 45 St., New York, N. Y.

Prices quoted for F&B cement: 1 oz., 40c; ½ pt., $1.50; pt., $2.50. Free sample of F&B #55 sent on request

Are You Moving?

If so, please notify us one month in advance. The Post Office does not forward magazines. To avoid delay, please cooperate by sending us both your *new* and *old* address.

Your carpets may be the thickest . . .



Your soft drinks may be king-size . . .



BUT EVERY PERFORMANCE STILL MUST BE PERFECT!

Perfect performances depend so much on the quality of service your equipment receives. Giving the *best* service is the day-by-day job of every expert RCA Theatre Service Engineer. And he alone has behind him all RCA's tremendous technical resources.

RCA SERVICE COMPANY, INC.
A Radio Corporation of America Subsidiary
Camden, N. J.

Columbia Issues Lighter-Density Prints

AFTER experiments in studio laboratories and investigation in the field of difficulties encountered when dark prints are projected on wide screens, and particularly on large drive-in screens, Columbia Pictures has begun a policy of providing lighter prints of all pictures released by the studio, it is announced in New York by Bill Brennan, supervisor of Eastern laboratory printing for Columbia.

The problem has been attacked in two ways, Brennan said.

First of all, directors have been instructed to avoid as much as possible low-key (relatively dim) lighting to establish a moody atmosphere. The most effective way to avoid release of dark prints, he continued, is not so much a matter of laboratory processing as it is of maintaining an adequate level of lighting on the studio set when a picture is photographed. Placement of set lighting to obtain greater contrast in the film image is also important.

Secondly, when both black-and-white and color films from Columbia are processed in the film laboratory, they are printed for a slightly lighter effect overall.

Pastel Tints Favored

Making prints lighter, even when dealing with black-and-white, is a more complicated matter than many people in the industry imagine, Brennan stated. Printing a lighter film image tends to reduce needed contrast. Special development procedures have to be worked out so that sufficient contrast is maintained.

With color prints, pastel effects are sought after instead of the brighter hues usually requested by Hollywood producers. The result is similar to the pastel effect usually preferred by English studios using the Technicolor process. Projectionists who have had occasion to show English color movies will be familiar with the difference, Brennan said.

Before making the move, engineers at Columbia examined some of the studio's recent films under field conditions at large theatres and drive-ins. It was found that some of the films, both black-and-white and color, were too dark for good projection on big screens. These films were: "The Harder They Fall," "Autumn Leaves," "Storm Center" and "The Last Frontier." Also criticized were some of the night scenes in "Jubal."

Examples of pictures released under the new policy are: "He Laughed Last," Technicolor, released in August; "Miami Expose," black-and-white, released in September, and "Solid Gold Cadillac," black-and-white with one color sequence at the end, released this month.

Supported by Experts

Columbia's move in providing lighter prints is favored by most experts on theatre projection, and is regarded as an important step in bringing production methods into line with present-day conditions in theatres. Some years ago, when drive-ins were few, and most theatre screens were less than half the area employed today, the dark moody scenes highly favored by many directors could be effectively projected. Under today's conditions, projection of over-dark scenes is likely to result either in a dim muddy effect on the screen or in blistering and buckling of the print with consequent loss of focus and irreparable damage to the print.

Brennan was particularly anxious to call the attention of projectionists to the unusual method of emphasizing the last or "clincher" scene in "Solid Gold Cadillac." This picture was made in black-and-white except for the last eighty feet which are in color. Because of the difference between the black-and-white and color emulsions, focus will have to be adjusted for these last 80 feet. Realizing the importance of first-class projection to audience enjoyment, Columbia is affixing a sticker to the reel warning about the focus change.

NYU Issues New Film Catalogue

More than 600 educational films in some 20 areas of interest are listed in the new catalogue of the New York University Film Library. The 79-page booklet also includes descriptions of the Film Library's services, as well as information on how to collect and order films.



ETHYLOID FILM CEMENT IS RAPIDLY BECOMING THE ACCEPTED STANDARD IN THE MOTION PICTURE INDUSTRY—FROM STUDIO LABORATORIES TO THE PROJECTION ROOM.

AVAILABLE AT ALL THEATRE SUPPLY DEALERS

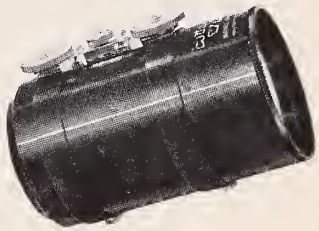
FISHER MANUFACTURING CO.
1185 Mt. Read Blvd.
Rochester 6, N. Y.

HILUX®

WORLD'S FINEST ANAMORPHIC PROJECTION LENSES!

Comparison tests in famous theaters throughout the world have proven Hilux Anamorphic Projection Lenses vastly superior. Precision designed and built, they have optimum optical correction for color, definition and distortion. You owe it to your audiences to use Hilux Anamorphics for *ALL* prints.

HILUX VAL



An amazingly precise *variable* anamorphic that gives non-vignetting performance with *both* 4" (101.6mm) and 2 25/32" (70.6mm) diameter prime lenses. Complete control up to 2X without shifting lens or projector.

HILUX 264



A high quality 2X *fixed* anamorphic for all projection lenses up to 2 25/32" (70.6mm) with a 64mm free rear aperture for maximum non-vignetting light transmission.

HILUX 152



A 1.5X to 2.0X *variable* anamorphic for all standard 2 25/32" (70.6mm) projection lenses. 64mm free rear aperture assures maximum light with no vignetting.

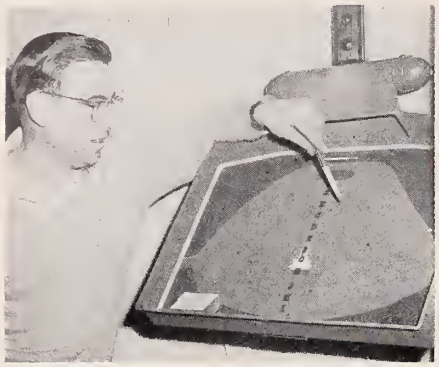
Hilux 264 and 152 are available with either fixed or variable corrector lenses. For catalog sheets and focal length computer, write Dept. P-66.

PROJECTION OPTICS

PROJECTION OPTICS CO., INC.
Rochester, N. Y. • London, England

Ramp Trouble Chart Work of Drive-In Projectionist

Warren Stiely, projectionist at the Key Drive-In, Lebanon, Penna., is responsible for an unusual device permitting quick attention to light failure, speaker trouble,



Warren F. Stiely, member of Local 554, Lebanon, Penna., demonstrates his novel ramp trouble chart.

and other difficulties experienced by drive-in theatres during show time.

Termed a ramp trouble chart, and maintained in the projection room of the Key Drive-In, it consists of a board on which the various ramps are identified alphabetically, together with a series of vari-colored pins. Ushers who note an extinguished light, a loose speaker cable, cars improperly parked, or other forms of ramp trouble, place a pin immediately in the proper ramp row on the chart.

One of the projectionists visits the area indicated and performs the necessary replacement or repair, thus maintaining peak efficiency throughout the entire ramp area during the show.

Stiely used a drawing board cut to fit an old music stand, painted it and countersank in the board the exact location of each speaker post. Each ramp is lettered, and by marking the board "north" and "south" it is a simple matter to report the exact location of the trouble.

SMPTE 16-mm Test Film

A new 16-mm test film which measures registration, aperture size, resolution, shutter timing, centering of the image, steadiness of its own image with respect to the perforation, and also provides a "thousandths scale" for measuring film movement in double-exposure testing of printer steadiness has been announced by the SMPTE.

The reel provides in a single test film of high accuracy several quantitative visual tests that have always been difficult to perform. It will be used for precise alignment of 16-mm blackand-white and color TV film chains, for quality control by manufacturers of 16-mm projectors, and in film laboratories to adjust 16-mm printers.

Development work on the film was done over a period of two and a half



Pattern from the new SMPTE test film for aligning 16-mm motion picture projectors and laboratory equipment.

years by George W. Colburn, of Geo. W. Colburn Laboratories, Chicago. It comes in lengths of 100 feet and is priced at $27.50. Orders for this test film should be sent to the SMPTE, 55 West 42nd St., New York 36, N. Y.



BOOK REVIEW

RADIO ELECTRONICS, by Samuel Seely, McGraw-Hill Book Co., 487 pages, $8.00.

This is a companion volume to "Electronic Engineering" by the same author, reviewed in IP, June, 1956. Though written as independent textbooks, together they represent a revision and extension of the author's "Electron-tube Circuits."

One of the main objectives of this book, as its title would indicate, is a study of the important electronic aspects of radio. But more than just an analysis of the elements of radio systems is undertaken. For this reason, general system block diagrams are discussed before any analysis is taken up. The author, a former professor of electrical engineering at Syracuse University, employs a new approach—that of stressing the techniques of analysis. Occasional alternate mathematical developments are included in order to illustrate the applicability of the different analytic techniques.

Among the special features this book contains is a more comprehensive discussion than is ordinarily available on feedback in amplifiers and the ratio detector and the Bradley detector in frequency modulation detection.

Among the new advances covered is Information Theory. A chapter on this subject relates some of the results of this theory with different types of communication systems. Illustrative analyses are frequently given to relate the theoretical considerations to practical situations.

THINGS TO COME

(*Continued from page* 19)

prism arrangement to pick up portions of the screen image and to project "surroundvision" by means of "reflecta-rama" mirrors located on the walls, with the left mirror covering the right wall and vice versa.

You have perhaps guessed that the theatre was actually built much along the lines of a semi-circular bandshell, with seating for viewers in the area where musicians are normally seated. This departure allowed for a panoramic view of almost 180°, but we noticed that in intimate portions of the film, diffused electronically controlled lighting was thrown on the area which would have been the wall portion of a present-day theatre.

The televised portion of the program followed, and only then did we understand why the tape recorders had three video channels. As the image came on, we were astonished to see that it was at an aspect ratio of 2 to 1 in beautiful color. The color was achieved by superimposing the three images which had been scanned by means of special light sources and filters in order to obtain a magenta, cyan, and yellow record. Monitoring instruments kept the crew informed as to color temperature and output of each channel, and the color balance was pleasingly uniform from scene to scene.

An interesting note is the fact that we were told that the use of tri-channel tape had made possible high-definition color without the use of the inherently poor field-sequential single-channel system which had been abandoned some years previously.

All in all, we enjoyed the visit to the theatre of the future, and we thought we would pass along some of the salient features of our trip. If the reader finds any or all of the proposals unbelievable, let him do his own dreaming. Twenty years from now, it could all be true, but don't be surprised if some of it comes to pass much sooner!

You can't make the pic better . . . but you can make it click better

How? Squeeze more of the entertainment value — for more of your patrons — out of every product you show. Give the *side*-seat patrons a break — don't let your "half-there" screen rob them of half the emotion. Fill more seats. Find out fast about the

VICRA-LITE

LENTICULAR SCREEN

"the screen of optical precision"

See your theatre supply dealer; write today for factual booklet, containing sample swatch.



L. E. CARPENTER & COMPANY
VICRA-LITE SCREEN DIVISION • Empire State Building, New York 1, N.Y.

Clayton Ball-Bearing Even Tension Take-Ups
For all Projectors and Sound Equipments
ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS.
SILENT CHAIN DRIVE

THE CLAYTON REWINDER
FOR PERFECT REWINDING ON 2000-FOOT REELS.

CLAYTON PRODUCTS CO.
31-45 Tibbett Avenue New York 63, N. Y.

MOVIES AND TV

(*Continued from page* 14)

patented his Telegrafone. This was a machine that recorded sound magnetically. Poulsen was able to give practical demonstrations of his apparatus in which he used a steel wire, similar to piano wire, upon which the sound signals were recorded and from which they could be reproduced by running it past a magnetic head. His invention of magnetic sound recording was to influence the future of television recording.

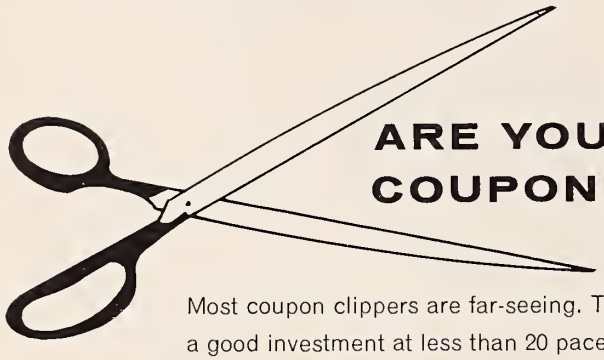
Magnetic sound appeared after steel recording but before photographic sound, but it, too, suffered from the drawbacks of that era. There were no good pickup devices or microphones. There were no vacuum tubes or amplifiers. There were no loudspeakers to reproduce sound.

Thus before the beginning of the twentieth century the foundations of motion pictures. television, and sound recording were all laid. Sound recording needed no electrical aids. The power of sound waves was sufficient to make its impression felt on a gramophone record. Magnetic recording, too, was a reality.

The motion picture needed no electrical aids. It had the three basic elements: the camera to record the image, the film to preserve and store the image, and the projector to cast the image on a screen. The first mechanical art was now complete.

Except for a suitable amplifier, television had all the basic elements it needed to produce a crude picture: the scanning disk or mirror drum to dissect an image, a selenium cell to convert light into electrical impulses, and a Kerr cell or light valve to modulate the light output at the receiver. The first electrical art still needed the vacuum tube in order to become a reality.

By 1900 all the elements for a basic television system were in existence except the means of amplification. The stage was set for the invention of the vacuum tube. Without it, the field of electronics could not have the power it needed. (The transistor did not appear until 1948.) Edison laid the ground work, and it is useless to speculate how much progress would have been made if he had perfected his Edison effect.



ARE YOU A COUPON CLIPPER?

Most coupon clippers are far-seeing. They can recognize a good investment at less than 20 paces.

There are various types of coupons. The one below suggests a good investment, too. Smart showmen who clip this particular coupon are taking a short-cut to an investment that pays dividends in perfect sound, satisfied patrons, and vanishing service worries.

Mail it today and join 6,000 service-happy exhibitors.

SPECIALISTS IN MOTION PICTURE SOUND

ALTEC SERVICE COMPANY

a Division of ALTEC COMPANIES, INC.

161 Sixth Avenue
New York 13, N. Y.



ALTEC SERVICE CORPORATION
161 Sixth Avenue • New York 13, N.Y.

Please have an ALTEC representative call, without obligation, to inform me about your service contract.

Also please mail copy of booklet—
THE ALTEC SERVICE STORY.

Theatre

City and State

Ask for

Ship Has 3-Deck Theatre

A theatre that extends through three decks, and which is equipped to show 35-mm films in CinemaScope, widescreen, and standard ratios has been incorporated in the new 22,000-ton Cunard liner, *Carinthia*. Seating capacity is 254, including a balcony entered from the promenade deck. Orchestra seats are off the main deck, while the projection room is at boat deck level.

With a 45′ throw to the screen, picture sizes are: standard, 9½′ x 7½′; widescreen, 12½′ x 7½′; and CinemaScope, 14½′ x 7½′. Masking is automatically controlled. A Westrex sound system and a non-sync record player are employed.

A unique feature of the projection room is the air-conditioning, which is a branch of the ship's system serving all public rooms. The projectionists have full control of the temperature in the room. In addition, extractor fans help draw out the fumes from the arc lamps. A rewinding machine, a rewinding bench, and splicer are all located in an alcove inside the projection room.

Your Best Buy — U. S. Savings Bonds

Lorraine ORLUX SUPER-CHARGED LARGE-CORED Carbons

For DRIVE-INS & THEATRES with HUGE, WIDE-AREA SCREENS • CARBONS, Inc. BOONTON, N.J.

PROJECTOR LUBRICATION

(*Continued from page 9*)

whence it travels through smaller tubes to all of the bearings served by the system.

The one-shot oiling system should be worked before the beginning of the first performance each day in the case of projectors which are well "broken in." New mechanisms are inclined to be a trifle stiff, and thus should be oiled before each 2-hour show. The oil reservoir should be drained, flushed out with clean oil, and then filled up with fresh Simplex projector oil about twice a year.

Lubrication Routine

It is obvious that over-oiling of the machine is an ever-present temptation with the one-shot oiling system. Even with just-adequate lubrication, the old oil is forced out of the bearings by the new; and the old oil has to go *somewhere!* It drips down upon the floor of the mechanism on the gear side, and must be swabbed up as in the case of hand-oiled projector heads. A little of the oil is certain to work out of the bearings on the film side, hence the importance of cleaning the mechanism frequently and thoroughly. The Ernemann II and the Hahn-Goerz II, German projectors of the early 1920's, were the first to utilize the one-shot method.

A better variant of the pressure-feed method of centralized lubrication, and one employed in the Simplex XL, the RCA Brenkert projectors, the Philips FP5, FP6, and FP7, and in all Ernemann models from the V (1929) to the present-day VIII, IX, and X, throws or sprays oil all over the moving parts continuously by means of an automatic oil-recirculating pumping system. This method is without doubt the best for projectors requiring liquid oil instead of solid or semisolid greases.

This lubrication system consists of either a series of oil-directing tubes or a sprayer to which oil is continuously conducted by a gear-driven pump. Oil is thus circulated throughout the entire gear side of the mechanism while the machine runs, the lubricant falling upon the gears and dripping into the bearings and the intermittent movement. From ½ to 1 pint of fresh oil is introduced directly into the "oil sump" of the gear compartment through a hole in the top of the mechanism case; and the recirculated oil usually passes through a series of wire-gauze strainers to remove dirt and, in the Ernemann and Philips projectors, also through a magnetic filter which removes all steel and iron particles.

Because the shafts are usually grooved over their entire length so that oil can flow continuously through these grooves and out at each end of the bearing to lubricate, wash, and cool the moving parts, special provision is made in modern automatically lubricated projectors to prevent oil leakage into the film compartment.

The oil-leakage problem is solved in the Brenkert and Philips mechanisms by carefully designed oil baffles and slingers on the film side of each journal. The Simplex XL, which has the modern "Spray-O-Matic" lubrication system, depends upon careful shaft design, including grooving, and oil-tight gaskets.

Maintenance Simplified

Except for minor parts needing only an infrequent drop or two of oil, these up-to-date motion-picture mechanisms require no lubrication on the film-compartment side. Steel pad rollers, for example, the lateral-guide rollers, the framing carriage, the gate-door slides, and the lens-focusing mount are among these parts. Nylon-bearing rollers require no lubrication. The oil should be completely changed in these projectors once or twice a year, and the strainers and magnetic oil filters thoroughly cleaned before the fresh oil is poured in. And here again we must repeat the warning to use only the oil recommended by the manufac-



SPLICES NOT HOLDING ?

Film breaks are costly. Play safe by using

JEFRONA

All-purpose CEMENT

Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.

CAMERA EQUIPMENT CO., INC.
DEPT. J
315 West 43rd Street New York 36, N. Y.
JUdson 6-1420

HUFF'S PACKAGE COOLING SYSTEM

Consisting of

(1) The Positive Carbon Cooler, (2) The Film Track Cooler, and (3) The Automatic Film Humidifier

will give you an advantage of from 10 to 25 per cent more screen light than is now available from your 16- or 18-inch mirror lamps used with Brenkert or X-L heads, plus a saving of 50 per cent lamp maintenance cost.

PROVE THE ABOVE IN YOUR OWN THEATRE.

See your dealer or write direct to

HAL I. HUFF MFG. CO. • 3774 SELBY AVENUE LOS ANGELES 34, CALIF.

turer of the projectors.

The Motiograph AA and AAA mechanisms represent a radical departure from the usual lubrication requirements of motion-picture projectors. Unlike the older models, such as the H, HU and K, which required hand oiling and the insertion of grease into the intermittent movement and shutter bearings, the modern Motiographs need no oiling at all! As far as this writer knows, the Motiograph is the only projector which completely relieves the projectionist of the chore of lubrication except for the intermittent movement, which requires a grease refill twice a year.

Permanent Lubrication

How has the task of lubrication been done away with in the Motiograph? In the AA and AAA, all bearings are grease-packed ball bearings *which require no further lubrication for their long lifetime!* Grease-packed ball bearings are also used on both the star and cam shafts of the intermittent movement—only the grease reservoir requiring a refill every 2 years. The gear teeth may also receive a film of grease for silent operation, although this is not mandatory because it was done at the factory when the machine was "run in."

The upper and lower film-magazine shafts of all projectors should be lubricated according to the manufacturer's instructions. The magazines of nearly all makes of projectors require oil, but Motiograph magazines are given grease twice a year. The soundheads, both optical and magnetic, require individual lubrication according to the recommendations of the maker. Most projector motors need only infrequent lubrication, and some motors even have lifetime-lubrication ball or roller bearings.

A *clean* projector will work better and last longer than a grimy one. When oiling your projectors, remember that 1 or 2 drops of oil properly applied will do more good than half an oil-canful splashed all over the parts. Keep the mechanisms and soundheads clean and free from grease and oil where lubrication is not needed. A grimy, oil-smeared mechanism soils film and collects dust. Dust and grit cause excessive wear. Fine projector mechanisms are precision instruments which must receive intelligent care and lubrication to deliver the near-perfect screen results they were meant to deliver.

Would You Like to Cast a Vote?

At this time (it being an election year), INTERNATIONAL PROJECTIONIST puts its ear to the ground to detect groundswells in reader opinion. So that our editors may render maximum service to the reader body, we invite you to help us draw up planks in the editorial platform.

We want a yardstick and cross-section of reader opinion on the type of subject matter they would most like to see covered in forthcoming issues of IP. To this end, we would like you, our reader-constituents, to vote your preference. Below is your ballot—fill it in and return to us.

INTERNATIONAL PROJECTIONIST, 19 West 44 St., New York 36, N. Y.

Gentlemen: I would like to see published in IP articles (and drawings) relating to the following subjects:

.....

.....

.....

.....

Name_____ Address_____

Theatres Sell Advertising

Advertising in theatres, in the form of 40- to 80-second trailers mentioning local dealers as well as national manufacturers, contributes an estimated $8,000,000 to $10,000,000 a year to the income of American movie houses. A total of 16,000 theatres throughout the country are currently taking advantage of this added take.

Neither the competition from television nor the decline in boxoffice attendance seem to be having much affect on the enthusiasm sponsors are manifesting for this mode of advertising. In fact, the 16,000 figure represents a rise in the past few years of 2,000 theatres now showing the short film ads, declares Claude Lee of the Motion Picture Advertising Service. An Albert Sindlinger research report revealed that 55,946,000 persons saw one or more of these advertisements during the week ending July 28; drive-in audiences contributed more than 50% of this total.

Closed-Circuit TV at Peak

RCA Service Co. reports that it has provided more than 50,000 hours of closed-circuit engineering services since the establishment of its closed-circuit TV service activity in 1954.

Company executive, W. L. Jones says that the 50,000 hours, covering 33 major telecasts supervised by RCA engineers, demonstrates that large-screen closed circuit television is now an accepted medium of business communication. Notable among the closed-circuit telecasts was the program heralding the successful discovery of the Salk Anti-Polio Vaccine and the recent dedication of the General Motors Technical Center in Warren, Mich.

Du Mont-Chromatic Deal

Allen B. Du Mont Laboratories has come to an agreement with Chromatic Television Laboratories, Inc., whereby Du Mont will begin a development program for the production of the Chromatic single-gun Color TV tube. Chromatic Labs., which is connected with Paramount Pictures, has been engaged for some time in development work on a simplified color TV receiver to make possible the sale of sets at a reduced price.

SMPTE Meets in Canada

The Society of Motion Picture and Television Engineers extends its activities into Canada with the first regional meeting ever held in the Dominion. The meeting will take place in Toronto on October 27th, when the Rochester section gathers at the Shelly Films Studio.



Guardians Of Your Health

...for fifty years!



1917



1918



19



1920


1921



1922



1923



1925



1926



1927



19





1931

Since 1907 your annual purchase of Christmas Seals has helped save more than seven million lives from tuberculosis.

Yet tuberculosis still strikes one American every five minutes, still takes more lives than all other infectious diseases combined—one every half hour.

When you buy and use Christmas Seals you help the National Tuberculosis Association and its 3,000 local affiliates work year round against tuberculosis—through case finding, education, research and rehabilitation.

It is possible in the next fifty years to win entirely the fight against TB. So please, send in your contribution today.



1932





1936



1937



1938


1939



1940



1941

50TH Annual Christmas Seal Sale



"Maybe I can't tell an electoral college from a prep school . . . but I sure know the difference in projection equipment! To me . . . the smooth dependable hum of my Simplex is the most convincing speech of all! And you sure can't take issue with the Simplex record of proven performance in almost every top theatre in the country! So take the advice any veteran projectionist will give you. If your present equipment keeps you fussin' and worrying . . . start your own campaign to get your boss to install a SIMPLEX X·L!"

Simplex X·L
T.M. REG. U. S. PAT. OFF.

PROJECTION and SOUND SYSTEMS

MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION • DISTRIBUTED BY NATIONAL THEATRE SUPPLY

SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

GPE

NOV 26 1956 D 622868

PROJECTIONIST

INTERNATIONAL



DEC 6 - 1956

NOVEMBER 1956

VOLUME 31 • NUMBER 11

30c A COPY • $2.50 A YEAR

No lamp in the World!

CAN PRODUCE SO MUCH LIGHT.

Peerless HY-CANDESCENT TRADE MARK REG

CINEARC

NOT A REFLECTOR ARC!

WRITE FOR DATA

Peerless MAGNARC TRADE MARK REG

CINEARC

A 75-77 AMP. REFLECTOR ARC!

22,000 TOTAL LUMENS ON SCREEN

NO-HIGH-RATE *OF ($60.00) REFLECTOR BREAKAGE AND SILVERING DETERIORATION OR HEAT FILTER UPKEEP* !

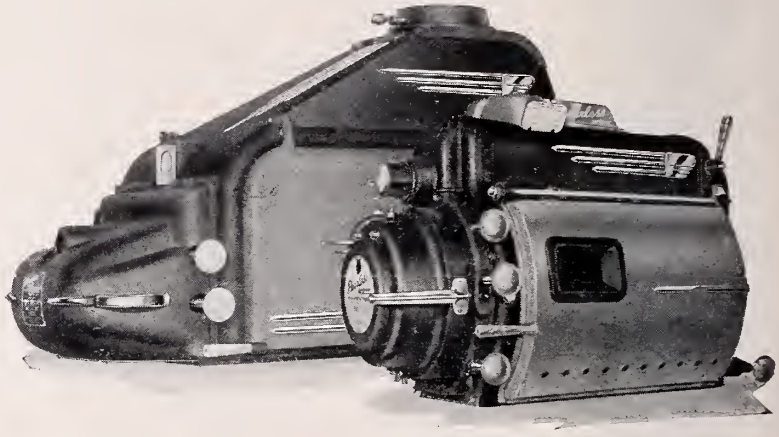
PROOF

Hy-Candescents were selected for all **important** "CINERAMA" installations. (Chicago, New York, Los Angeles, San Francisco, Philadelphia, and Washington, D. C.)

Hy-Candescents were chosen by Paramount for **all** installations of Horizontal "VISTA-VISION".

Hy-Candescents were again selected by TODD-AO for "OKLAHOMA".

You have to do the same if you want all the light there is for big pictures.



At 75-77 amperes . . . With presently available and standard 8 x 9 m/m copper coated carbons . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . With a 14" diameter No. 2012 PEERLESS "Hy-Lumen" glass reflector that retails at a list price of $22.00 F.O.B. Chicago . . . With a No. 2880 PEERLESS Tail Flame Flue . . . On any kind or any size screen . . . No Heat Filter required.

All of this, at the **lowest** possible first, and operational **cost**. And

J.E.McAULEY MFG.CO.

552-554 WEST ADAMS STREET

CHICAGO 6, ILLINOIS

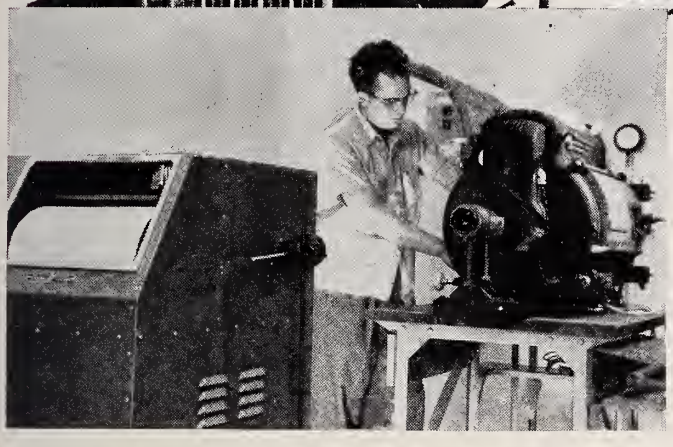
A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

NOV 26 1956 B 622868 B 622868

At the outer boundaries of knowledge...

New Research Laboratories in Parma, Ohio. To expand its basic research in solid state and chemical physics, National Carbon Company has recently enlarged its staff of scientists and provided them with an ideal laboratory setup for creative work.





Studying color balance for better color movies. The spectroradiometer analyzes the complete "rainbow" of colors in projected light — to give an investigator, in one and a half minutes, information that he formerly worked half a day to get. Research like this helped National Carbon Company win the coveted "Oscar" this year for developing lighting carbons which were balanced to operate with other studio lights.

New "particle" theory promises help in developing still brighter carbon arcs

Although the high-intensity arc has been around for forty years now, nobody has yet been able to explain satisfactorily how it produces the super-bright light so useful for movie projection and studio lighting.

At one time it was thought that the brilliant light came from atomic reactions taking place within the glowing crater or pit at the tip of the positive electrode where the energy of the arc is highly concentrated. But this theory has been radically modified by researchers at National Carbon's laboratories.

Now it is believed that a much more complicated process takes place in the crater region where powerful electrical currents heat the carbon to temperatures of 10,000 to 12,000 degrees Fahrenheit, roughly the temperature of the sun's surface. According to the new "particle" theory, material from the molten floor of the crater vaporizes into tiny particles of the order of a millionth of an inch in diameter. These white-hot liquid droplets stream out into the space between the carbon electrodes of the arc to form a long, luminous tail flame or "comet tail."

Precise knowledge of this process, combined with results of other experiments now under way at the Parma laboratories, should point the way toward new, brighter lighting carbons that will stand up to higher and higher currents and temperatures. More details of the work at Parma are given in a new booklet titled "Research." Write for a copy.

Look to **NATIONAL CARBON** *for leadership in lighting carbons*

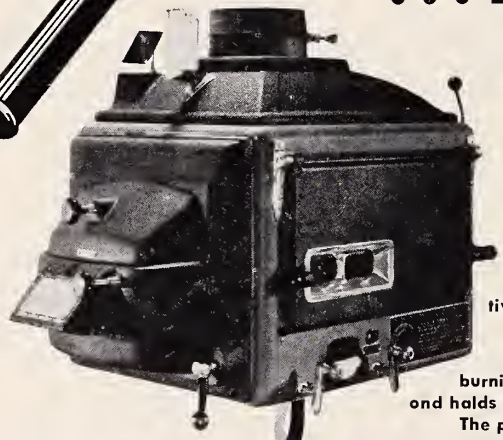
NATIONAL CARBON COMPANY • **A Division of Union Carbide and Carbon Corporation** UCC **30 East 42nd Street, New York 17, N.Y.**

Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco. *In Canada:* Union Carbide Canada Limited, Toronto

The Lamp that Brings Out Picture Detail



. . . Like a Magnifying Glass



Pictures are always clearest and brightest, regardless of size or shape, when you have the intense light of the powerful Excelite "135" Projection Arc Lamp designed especially for mammoth size screen projection. The light is evenly distributed and always of the same color, without variation. National's blower-cooled Reflect-O-Heat Unit permits this great increase in light volume without a corresponding increase in heat at the aperture.

The Excelite "135" burns a choice of four carbon trims (9, 10 or 11 mm regular, or 10 mm Hitex). New long-life, positive carbon contacts are provided and water-cooled carbon contacts are optional. Correct amperage is selected by a single control.

The amazing crater-positioning system automatically controls the burning of both carbons, maintains the correct arc gap length at all times, and holds the positive arc crater at the exact focal point of the reflector. The projectionist is accordingly freed from the necessity of constantly supervising the arc.

The Excelite "135" comes equipped with an 18″ f 1.7 or 16″ f 1.9 ventilated reflector and reflector frame. An air jet stabilizes the arc, and keeps the tail flame away from the reflector. The oxygen thus supplied prevents deposit of soot and the heat-absorbing scum which causes mirror breakage.

Conversion features available for wide-gauge film presentation include provision for burning 20-inch 13.6 mm carbons, a wider opening in the nose, a dowser which covers the bigger opening, and a new high magnification mirror.

DISTRIBUTED BY N.T.S

NATIONAL THEATRE SUPPLY
Division of National • Simplex • Bludworth, Inc.

A SUBSIDIARY OF GPE

International PROJECTIONIST

R. A. ENTRACHT, *Publisher*
JAMES MORRIS, *Editor*
R. A. MITCHELL, *Contributing Editor*

Volume 31 NOVEMBER 1956 Number 11

Index and Monthly Chat 5

Gretener Ventarc for Todd-AO 7
JOSEPH TRITSCH

New Trends in Hollywood Film Making 9

SMPTE President Advises Caution on Additional New Processes 10
JAMES MORRIS

Pros and Cons on Magnetic Sound 12
JAMES TOLER AND ROBERT A. MITCHELL

Two Methods of Improving Projection Technique 13
JOSEPH HOLT

Better Light from HI Reflector Arcs 14
ROBERT A. MITCHELL

A Tour of the Photokina 17
R. HOWARD CRICKS

In the Spotlight 20

Projection Clinic 22

Science Notes 23

Genarco's New AC Arc Spotlight 23

Personal Notes 24

Miscellaneous Items, News Notes, Technical Hints

INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co., Inc., 19 West 44 Street, New York 36, R. A. Entracht, President. Telephone: MUrray Hill 2-2948. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States and U. S. Possessions, $2.50 per year (12 issues) and $4.00 for two years (24 issues). Canada and Foreign countries: $3.00 per year and $5.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Entered as second-class matter February 8, 1932, at the Post Office at New York, N. Y., under the act of March 3, 1879. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles. Entire contents copyrighted 1956 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

420

Monthly Chat

Technical Showmanship

TWO ARTICLES describing very different approaches to the problem of attracting more patrons to theatres through the skilful use of the right projection and sound equipment can be found in this issue of IP. They describe two very different types of theatre operation—both of which are prospering.

One article concerns the elaborate roadshow installation for presenting "Around the World in 80 Days" at the Rivoli Theatre in New York City. The other deals with a small neighborhood house in a suburb of San Francisco which is owned and operated by Jim Toler, an IA projectionist with extensive experience in both theatres and Hollywood studios and a man who takes showmanship seriously. In both cases, the men responsible for installing and operating projection equipment made maximum use of the resources available to them.

At the Rivoli in New York, Joe Tritsch, supervisor of projection for the Michael Todd Co., made a frontal attack on the problem of brightly lighting the giant Todd-AO screen. Working through National Theatre Supply, he arranged for the importation of Gretener Super Ventarc lamps and developed an extensive cooling system to adapt these powerful and complicated lamps for film projection. Tritsch is also from the West Coast and is another IA man of long experience, both as a projectionist and as an inventor and developer of theatre equipment.

On the other hand, Toler had little money available for re-equipping his small theatre and no need for such powerful equipment as the Gretener lamp. But by strategic purchases of much more modest equipment, he has been able to bring to his neighborhood house a quality of showmanship that excites a lively interest among his patrons.

These very different achievements go far in quieting fears that motion picture theatres are in a helpless position because of TV competition. If skill and ingenuity are brought to bear and proper use is made of the improved projection and sound equipment now available, much can be done to stimulate wide interest.

We are not, however, trying to make the dangerous assertion that the story told by a motion picture is less important than the size of the screen or the number of surround speakers attached to the sidewalls of a theatre. Obviously, tickets to "Around the World in 80 Days" did not become as difficult to obtain as those to the most important musical show of New York's legitimate theatre only because the screen is bright. But it is a fact that the high quality of projection has contributed much to audience enjoyment of the Todd-AO presentation.

Neither do we say that all is right in the industry so far as the conception and development of the new processes are concerned. It must be noted that the story of Toler's showmanship appears in IP because he included a description of his projection methods in a letter taking issue with an article on magnetic sound reproduction which recently appeared in the magazine. Being a progressive individual, he installed magnetic sound early and has since been disappointed to find that there is controversy over the value of this form of reproduction.

SPECIAL
pre-publication offer!

Send for your copy of the most complete and practical handbook for projectionists ever compiled!

Robert A. Mitchell's 500-Page MANUAL OF PRACTICAL PROJECTION

These chapter headings indicate the completeness of the book's contents:

PART I: FILM

- Inspection and Repair of Prints
- Prevention of Damage to Prints
- Film and the Heat Problem

PART II: THE PROJECTOR

- Notes on Projector Maintenance
- Film-Guiding in the Projector
- The Intermittent Movement
- Functions of the Projector Shutter

PART III: PROJECTION OPTICS; SCREENS

- Optical Efficiency in Projection
- The Projection Lens
- Lens-Matching; Care of Lenses
- Screen Types and Picture Brightness
- Screens, Apertures, Aspect Ratios

PART IV: THE ARC LAMP

- The Carbon Arc
- Operating Characteristics of Arc Lamps

PART V: GENERAL PROJECTION PRACTICE

- The Projectionist's Role as a Showman
- Projection Preparations for the Seasonal Theatre
- More Light for Drive-In Screens

PART VI: MOTORS, GENERATORS, AND RECTIFIERS

- Types of Motors
- Maintenance and Servicing of Motors
- Types of Generators
- Maintenance and Servicing of Generators
- Rectifiers for Projection Arcs

PART VII: SOUND REPRODUCTION SYSTEMS

- Photocells and Optical Sound
- Testing Amplifier Parts
- The Sound-on-Disk Reproducer
- The Sound-on-Film Reproducer
- Acoustics in Projection

PART VIII: PROJECTION OF COLOR AND 3-D FILMS; FORMULAS

- The Projection of Color Films
- Stereoscopic Projection
- Useful Projection Formulas

at a money saving pre-publication price of only **$4.50** *regular price $6.00*

● Hundreds of requests have been received for a permanent record of the Robert Mitchell articles that have appeared in INTERNATIONAL PROJECTIONIST. A handsomely bound compilation of the BEST of these articles is now on the press. By placing your order now . . . you'll save money and be one of the first to get a copy.

● This manual is divided in 8 sections and contains 30 chapters (see listing). A practicing projectionist as well as a recognized authority in this field, author Mitchell covers clearly and thoroughly every aspect of motion picture projection . . . from adjusting an arc lamp to the splicing of film.

● Profusely illustrated and crammed full of practical projection knowledge, Mitchell's MANUAL OF PRACTICAL PROJECTION differs from every other projection work in at least 3 ways:

1. **Its contents have received the enthusiastic approval of experienced projectionists.**
2. **<u>It does not</u> contain elementary principles of physics taken from school textbooks.**
3. **<u>It does not</u> contain manufacturers' pamphlets available to any projectionist for the asking.**

INTERNATIONAL PROJECTIONIST
19 West 44 St., N. Y. 36, N. Y.

Gentlemen: Please send me ..... copies of R. A. Mitchell's MANUAL OF PRACTICAL PROJECTION at the special pre-publication price of only $4.50 per copy, postage prepaid. Enclosed is check (or money order) for $.....

NAME.....

ADDRESS.....

CITY..... **ZONE**..... **STATE**.....

INTERNATIONAL PROJECTIONIST

Volume 31 NOVEMBER 1956 Number 11

Gretener Ventarc for Todd-AO

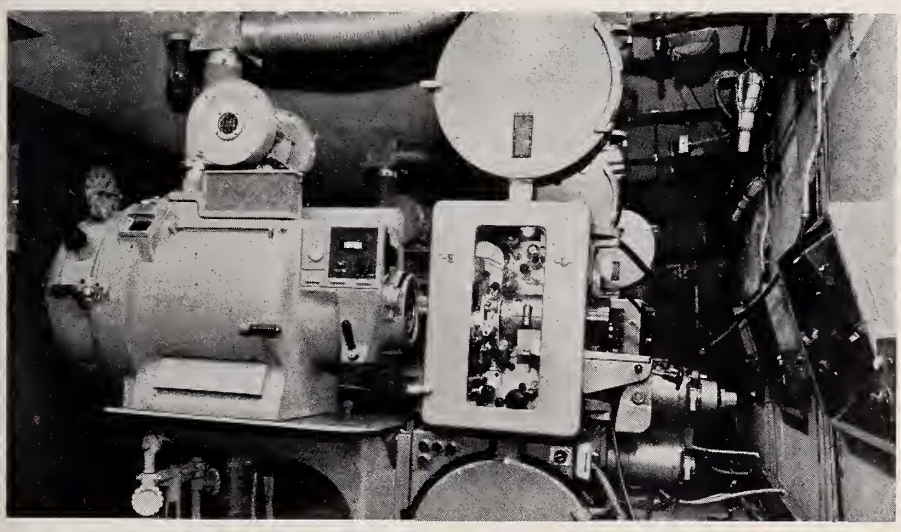
By JOSEPH TRITSCH

Supervisor of Projection
Michael Todd Co.

This powerful arc lamp, designed in Switzerland for the requirements of the Eidophor theatre TV system, is now being used at the Rivoli in New York for presenting "Around the World in 80 Days."

THE MOST powerful projection arc lamp known, the Gretener Super Ventarc, is now being used at the Rivoli Theatre in New York City for 70-mm projection of the latest Todd-AO feature, "Around the World in 80 Days." We imported this lamp from Switzerland through National Theatre Supply after we decided that its great light output is necessary to obtain the best possible screen image for the giant-screen Todd-AO presentation at the Rivoli.

I believe this is the first time that the Gretener lamp, which was designed to meet the tremendous light requirements of the Eidophor theatre-TV projection system, has ever been used for film projection in a theatre. In adapting the lamp to our purposes, a number of problems had to be solved. The most important problem involved protecting the film from the great heat generated by the projection beam of this lamp. Other problems involved simplifying the operation of this necessarily complicated lamp, and designing a protective Safety Control Circuit so that the lamp would be reliable in day-to-day projection-room operation. Our solution to these problems will be described later in this article.



Overall view of the Gretener Super Ventarc mounted on one of the Todd-AO projectors at the Rivoli Theatre in New York City. The blower unit that generates the stream of air that constantly surrounds the positive carbon can be seen at the top of the lamp.

More interesting perhaps are the vital statistics on our Ventarc operation at the Rivoli. We operate the lamp at 230 amperes and 75 volts, taking current directly from the DC mains of the New York Consolidated Edison Co. with two 200-ampere ballast rheostats in our circuit. Burning 12-mm Ultrex carbons at the high 60-inch-per-hour burn rate of the Ventarc, we utilize something over 65,000 lumens.

On our 60- by 30-foot screen, we get a light level of 30 foot-lamberts a the center of the screen and 20 at the side. Our screen, by the way, curves to a depth of 13 feet.

Note of Caution

However, it seems wise at this time to caution those interested in the possible use of a high-light-output lamp of this type to consider carefully the increased cost of installation and operation before deciding to use this light source in their particular operation. For instance, adapting the Ventarc to a theatre would necessitate the use of a number of separate and expensive cooling systems which would add to the cost of installation and operation.

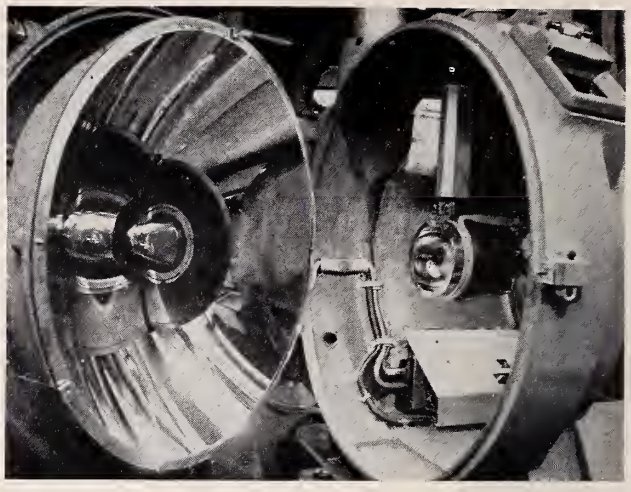
The above statements are not made to depreciate in any way the real value of this powerful lamp, but only to prevent the assumption that this value can now be easily obtained. Experiment and development work on the Gretener

Super Ventarc is proceeding in this country and, before long, it may be adapted to considerably wider use.

As noted earlier, our most important problem in making use of the Ventarc was in finding a way to protect the film from the heat contained in the radiant energy generated by this lamp. It was my contention that filters were not the answer. For one thing, it would be difficult to obtain filters capable of standing up under the great heat generated. For another, I don't think that it is wise to generate a lot of light and then lose a large portion of it through filters.

We therefore decided to test a method of cooling by refrigerated air that is new to the field of motion pictures, but which has been employed for many years in the refrigeration and air conditioning fields. Working on the principle that the real problem was to keep the film cool and that cooling of the film gate and mechanism was secondary, we conducted experiments with a specially designed refrigeration system that delivered cold air under pressure to the film not only when the film was directly in front of the aperture but also just before it reached the aperture. The refrigeration plant provides perfectly dry air at minus 30°F. at about 20 cubic feet per minute. However, there is some loss in temperature during transit to the projectors.

According to the best refrigeration information I could obtain, a cold "envelope" had to be provided. This was accomplished by blowing refrigerated air at the film from special openings that aimed the cold air at the film at both the proper angles and location. The cold envelope is most effective in reducing heat on the film because it pre-cools the film just before it reaches the aperture and protects it during the short interval that it is held stationary —less than 1/24th of a second for standard film, and less than 1/30th of a second in the case of the faster-moving Todd-AO system.



Open view of the rear of the Gretener Super Ventarc lamp. The revolving graphite disc, which is the negative carbon, can be seen at left protruding from the 24-inch metal reflector. The positive carbon can be seen at right surrounded by a smaller mirror which picks up edge light that would ordinarily be lost. An integral part of the Ventarc system is a stream of air emitted from a duct in the center of the smaller mirror that surrounds the positive carbon.

Refrigeration Details

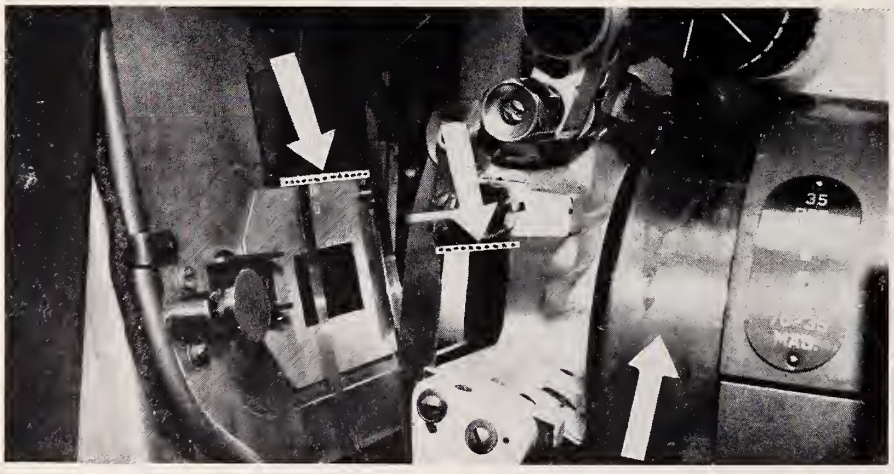
In our tests and at the present Rivoli Theatre installation, we use copper tubing ¼ inch in diameter to conduct the refrigerated air to the tiny openings in the tubing on both sides of the film. These openings are 0.031 inches in diameter and spaced 0.125 inches apart. They cover the entire width of our 65-mm aperture which amounts to 1.912 inches, and there is an additional opening on each side of the aperture, both in front and in back of the film.

A Gretener Super Ventarc lamp, pulling 240 amps. and 75 volts was used as a light source in our tests. A pyrometer was employed as a measuring device to determine the heat at the aperture with the projector running but with no film in the gate and no refrigerated air blowing. The temperature of the radiant energy emitted by the Ventarc was found to be approximately 3000°F. at the center of the aperture.

A focus chart made into a loop approximately 12 feet long was then placed in the projector in the usual manner and operated without the benefit of refrigerated air cooling. Warpage and embossing became apparent almost immediately. Another test strip of the same type was then placed in the projector with the refrigeration system in operation and the loop was run approximately 20 minutes with no apparent effect on the film. It remained cool to the touch and showed very little deterioration.

Due to the fact that the openings in the tubing delivering refrigerated air to the arc-lamp side of the film are slightly higher than those on the lens side, the film itself is pre-cooled before it reaches the aperture as well as during the projection period. The openings on the lens side reinforce the cooling effect when the film is in front of the aperture.

As far as we have determined to date, there seems to be very little relationship between a rise in amperage



Open view of the Todd-AO projector mechanism showing positioning of the tiny vents which distribute refrigerated air over film to protect it from the heat contained in the Ventarc light beam. The two upper arrows point to horizontal white lines with black dots which illustrate the position of the vents on both the arc-lamp and lens side of the film. Refrigerated air is forced through these vents to form a protective cold envelope around the film. The dotted white lines are not actually part of the mechanism but are superimposed on the photograph to illustrate the position of the vents which are not visible in the picture. Arrow at lower right points to water-cooled jacket which surrounds the lens to prevent breakage of lens elements under great heat and to stabilize expansion of the entire lens assembly during projection.

and corresponding rise in film temperature due to the fact that the film is protected by the cold "envelope" of air. It seems that the film temperature under these conditions remains low regardless of the radiant energy impressed upon it.

Carbon Feeding System

One change in the Super Ventarc lamp itself in order to adapt it to our purpose was to eliminate the magazine feeding system for positive carbons. Because of the lamp's high consumption rate for positive carbons, the design of the Ventarc provides that positive carbons be automatically fed from a special magazine.

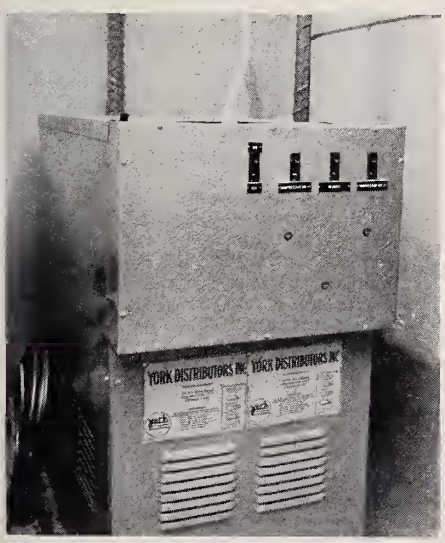
Since this system was considered subject to possible breakdown in day-to-day projection-room operation and also greatly increased the complexity of the lamp, we arranged to obtain from the National Carbon Co. specially made 12-mm Ultrex carbons of 27 inches in length which last for one reel at a burn-rate of 60 inches per hour. The negative carbon feed creates no problem since the negative is a graphite disk, as shown in an accompanying illustration. This disk measures 220 mm in diameter and 6 mm in thickness and lasts for six hours of operation.

Safety Device

An additional problem lay in the complicated cooling system of the lamp itself. Both air and water cooling are required for the lamp and projector mechanism. Plus that, the Ventarc system develops its intense light with the aid of a stream of air originating behind the positive crater and blowing around it. If any of these cooling devices were not operating or failed to function at the time the arc was struck, the arc mechanism would incur serious damage in a matter of seconds.

For this reason I designed a Safety Control Circuit for the lamp which, like other equipment designed to adapt the Gretener Super Ventarc to Todd-AO projection, is now being patented by the Michael Todd Co. The circuits which activate blowing and cooling devices for the Ventarc also activate relays in this control system. Unless these relays are activated, the arc cannot be struck.

Another feature of our installation at the Rivoli is a lens cooling system which surrounds the lens with a water circulating jacket. Cooling of the lenses serves two purposes. It prevents breakage of the lenses through heat, and it stabilizes the expansion of the entire lens assembly during projection, thereby preventing changes in focus.



Above is the refrigeration unit which provides a high-pressure stream of cold air to cool the 70-mm Todd-AO film when it is projected with the Ventarc.



Shown here is the safety control circuit that protects the ventarc and projector from damage in case any part of the cooling system fails to function. Circuits that activate the air-cooling, blowing, and water-cooling systems also activate relays in this automatic control box. Unless all of these relays are activated, the arc cannot be struck.

New Trends in Hollywood Film Making

SOME interesting new trends have turned up lately in Hollywood film making. First, there is the move toward the major "epic" picture, with running time as long as four hours. Then there is the curtailment of the second or "B" feature, both in length and expense. Still other discernible trends include a de-emphasis of the importance of color and the inclusion of highly controversial subjects in recent and forthcoming major productions.

All of these trends, rather than reflecting acts of desperation in the face of a formidable TV popularity, are the outgrowth of some very clear thinking recently adopted by the Hollywood studios. If there is a formalized policy underlying these recent trends, it is to cut expenditures and time from comparatively inconsequential films, to inject serious notes of consequence in as many films as possible, and to go all out in time and money to do full justice to potentially topnotch productions. In short, the Hollywood attitude currently seems to be to offer the public a minimum of the drivel it gets in such quantity on television and more of the good things that only theatre movies can provide.

Success of Roadshows

Let us consider the long-running "epic" film first. Paramount's recent release of "War and Peace" runs 3 hours and 28 minutes from start to finish, while its forthcoming "The Ten Commandments" is expected to run over four hours. On Columbia's schedule is a four-hour production of the best-selling novel, "Andersonville."

There is the possibility that these "longies" may start out as roadshows. Whether they do or not the producers are confidently anticipating huge profits —this in spite of vast production expenditures. Their optimism is based to a large extent on the successful roadshowing of such films as "Oklahoma!", now nearing its 50th week at the Rivoli Theatre in New York City, and the three Cinerama features. It should be remembered that high prices were—and still are—demanded at the boxoffices for admission to these shows, a fact which did not—and is not—keeping patrons away. Now that "War and Peace" has finally arrived, public reaction will be carefully watched by more than one producer hoping for a long-film bandwagon to jump on.

On the other side of the ledger, as regards time and cost of Hollywood films, is the paring down of the second feature attraction. The public still likes double feature programs, but it doesn't seem to want them as long as has been in the past—and it is also demanding quality on both ends. Hollywood at last has become aware of this and the trend now is for shorter and better second features.

Another factor contributing to the streamlining of second features today is the higher break-even figure together with diminishing returns. For example, years ago a good second feature could

(*Continued on page* 34)

SMPTE President Advises Caution On Additional New Processes

By JAMES MORRIS

Frayne tells Los Angeles convention that industry is turning from further innovations and toward standardized projection.

THE RECENT Fall convention of the Society of Motion Picture and Television Engineers, held last month at the Ambassador Hotel in Los Angeles, was a meeting most concerned with the present and future well-being of the motion picture theatre.

In the opening speech of the convention, Dr. John G. Frayne, West Coast technical manager for the Westrex Corp. and retiring president of the Society, asserted that a halt is being called to random introduction of new processes and much greater emphasis will now be placed on the establishment of uniform technical standards for both exhibition and production of films.

A large number of technical papers describing methods for both simplifying and improving present projection methods were presented at the convention. Among the topics dealt with in technical papers were improved high-intensity carbons, a reversed anamorphic lens, heat-reflecting filters, and an adjustable screen frame which would allow exhibitors to vary the screen curvature used in their theatres without replacing equipment. Other papers covered high-powered Xenon or short-arc projection lamps and a "cold-focus" film gate which resists the tendency of film to buckle by clamping it between glass plates geared to the intermittent movement of the projector.

Aid to Projectionists

In addition to the above, the SMPTE took note of the difficulties projectionists encounter in trying to get first-class results from wide-screen projection equipment in many theatres. To aid in this problem, the Society has set up an information committee to aid projectionists in solving technical problems.

In stressing the need for standardization and a cautious approach to the introduction of any additional new process, Dr. Frayne, the Society's retiring president, addressed the convention as follows:

"There is ample evidence of a tendency to reduce the number of different types of prints for the theatre. In addition, some of the new systems under discussion two years ago have not, so far, shown the progress anticipated. And the few new systems that are functioning provide product for only a minor fraction of the motion picture screens of the world. The salvage value of many of these new proposals has since been discovered to be in the effectiveness of the larger negative area available in the camera with resulting higher picture definition on the 35-mm print.

Emphasis on 35-mm Prints

"It appears, therefore, as we meet for the 80th convention of the SMPTE, that the industry is showing less interest in developing new innovations in wide-film systems. It is tending instead to re-emphasize the standard 35-mm medium with whatever embellishments can be retained without adding further to ultimate print and production costs.

"The increased costs of production and distribution of the many versions of prints demanded by the specialized processes have proved to be an almost insuperable burden to the producing studios. The resulting confusion and the increased cost to the theatre owner to provide equipment to play any and all of the films offered to him have proved to be a powerful deterrent to their general adoption. One can imagine, for example, the reaction of a theatre owner to playing 35-mm, 55-mm, and 70-mm in a single booth, with the added complexity of 4-track and 6-track magnetic stereo, optical and perspecta sound, plus screen aspect ratios varying from the old standard 1.33 to 2.55.



John G. Frayne, president of the SMPTE (left), presents gavel of office to newly elected president Barton Kreuzer, who will begin his two-year term in January 1957.

"However, an equally important reason for pausing and taking stock lies in our hasty departure from a long adopted standard to a multiplicity of practices, set in many cases by arbitrary unilateral action. It seems in retrospect that the engineers and executives of the industry should have evaluated the long-range effects more carefully before introducing each of these new techniques. An effort should have been made to determine the value of each and every innovation with an eye toward eliminating those which could offer only a degree of current sensationalism, and which would serve only to inhibit and delay the orderly progress of the industry."

Anamorphic Standards

In line with Dr. Frayne's emphasis on the need for standards, the Film Projection Practices Committee of the SMPTE met during the convention to consider a recommendation that the aspect ratio for anamorphic projection be standardized at 1.35 to 1 for all prints, whether carrying magnetic, optical or combination sound tracks. 20th Century-Fox is in agreement with this move and has announced independently that all of their future Cinema-

(*Continued on page* 31)

BEFORE You Put Your Money on the Line for Rectifiers



be **SURE** that they were *designed specifically for use with projection arc lamps,* and are not just general purpose rectifiers. The one way to be SURE is to buy only those that were engineered and manufactured by arc lamp specialists.

Be **SURE** that the selenium stacks are FULL SIZE . . . adequate to the job expected.

Be **SURE** that the stacks are DAMP PROOFED . . . that they will withstand wet climate and winter storage, and be sure that the damp-proofing meets the exacting specifications as demanded by the military services.

Be **SURE** that *AMPERAGE OUTPUT can be readily changed DURING LAMP OPERATION* as with the 3 easily accessible rugged 8-point dial switches illustrated.

Be **SURE** that they have Type H *glass-type insulated transformers* which means that they will withstand up to 150° F higher temperatures than Type A cotton insulated transformers. Thus they will permit emergency operation of both lamps on one rectifier.

Be **SURE** that they are capable of being adjusted to compensate for line phase unbalance.

Be **SURE** that they include a heavy duty fan and line control relay.

Be **SURE** that they carry a GUARANTEE that you can depend on.

NO OTHER RECTIFIER GIVES YOU ALL THESE ASSURANCES

The New Strong "Red Arrow" Selenium Rectifier



90 to 135 Ampere and
120 to 180 Ampere 3-phase;
70 to 90 Ampere and 90 to 135
Ampere single phase models.

Engineered for complete dependability, utmost economy and peak efficiency in converting A.C. current to D.C. for use with angle or coaxial trim high intensity lamps.

THE STRONG ELECTRIC CORPORATION.
31 City Park Avenue — Toledo 1, Ohio

Please send free literature on Strong Rectifiers.

Name .....

Theatre .....

City and State .....

Name of Supplier .....

The Finest Rectifier Ever Offered at Such a Low Price!

A skillful projectionist-showman on the West Coast disagrees with the opinions about magnetic sound voiced by Robert Mitchell in recent issues of IP.

Pros and Cons on Magnetic Sound

By JAMES W. TOLER

FIRST, let me explain that I am a member of IA Local 762, San Luis Obispo, Calif. I have been a projectionist for many years and did studio work in the late 1930s. I went into the drive-in theatre business for myself in 1939 but sold out in 1953 because I felt that the advent of CinemaScope and wide-screen plus stereophonic sound would revive interest in four-walled houses. Believe me it has been a struggle—one I could never have survived without wide screen and stereophonic sound.

I have read Robert Mitchell's articles with much interest for some time, and this is the first time I have cause to really disagree with him. If I am not mistaken, Mitchell works in a de luxe downtown house in the East. I gathered from an article he wrote some years ago that he was somewhat of an artist in addition to being a pretty sharp cookie on projection, optics, color processes, etc. To me, this places him well above the average in intelligence, hence a lot more critical.

Let us examine the CinemaScope installation in my theatre, for example. I spent roughly $2000 on it. With CinemaScope using optical sound I did absolutely no better at the box-office despite the investment of $2000 which, incidentally, I had to borrow. I have 610 seats in a theatre built in 1950—not too old.

Audience Applauded Sound

Last year, 1955, I bought penthouse reproducers with a mixer using all 4 channels playing over my regular RCA system. I booked several Fox shorts until I could manage to get served with magnetic prints on features. Each time I ran these shorts with magnetic sound, my audience applauded when it ended. I should add right here that I have had surround speakers for over two years which I play manually on all opening music and for thunder choral groups in background music and the like. We had received favorable comment about this long ago from adults who couldn't figure why our sound was so much more effective. When I first installed the surround speakers on an RCA theatre amplifier, we were asked many times if we had stereophonic sound.

In talking with people in my club (Kiwanis) and others who frequent my theatre, I soon learned that surround sound affected them more than anything else. If they heard sound from around them, they deduced that it was stereophonic sound. They were amazed to learn that there were three sets of speakers on the stage at some other theatres.

I think Mr. Mitchell is way off base regarding surround channels. I know of no theatre in this area cutting them out of the circuit and using them for phonograph records to be played during intermissions. And if he knows of

(*Continued on page* 25)

By ROBERT A. MITCHELL

THIS WRITER seldom receives comment as unusually specific and unequivocal as that from Brother Toler. All of us are entirely convinced that he has a jim-dandy of a theatre with superb projection and beautiful sound. This is a case where neither dint of argument nor critical dissection can depreciate the claims of a man who is not only sincere in what he says, but unconsciously conveys a rare quality of showmanship.

As an expert and active showman, Mr. Toler gives us the benefit of his excellent layout and, most important, the details of his procedure in presenting both the show, itself, and a superior quality of intermission music. (The writer admits a prejudice: as a George Wright fan of long standing, he has worn out several copies of Mr. Wright's Paramount Organ recording of "Tenderly"—not to speak of several other selections played on great theatre organs!)

Examined Variety of Prints

When examining the question of magnetic *versus* optical tracks for theatre-release prints, I listened to a great deal of horrible sound from both magnetic and optical tracks on *wornout* prints, playing both single-channel to simplify the comparison. I could get a fair idea of the amount of use to which each print had been subjected by examining the condition of the sprocket holes. And while the damaged optical prints were troubled mainly by *noise* (due to scratches in the soundtrack area, of course), the damaged magnetic prints suffered from actual *deterioration* of the sound (loss of volume, loss of higher frequencies, noise pickup, and actual distortion.).

In prints so worn that the sprocket holes were cracked or torn at their corners, optical tracks could be restored to their original quality, in most cases, be merely cleaning the film. In other words, the soundtrack areas were fortunately free from scratches. Similarly worn magnetic tracks were hopelessly bad; and the quality varied greatly even in the same reel, the sound changing from loud and clear to faint and muffled.

The intensity of ground noise also varied. Moreover, splices were much noisier in the magnetic tracks, and were not amenable to simple corrective blooping, as are even the worst splices in optical tracks.

Such tests are unfortunately not conclusive without the inclusion of test-frequency tracks—which, naturally, would not be present in any release print. But optical tracks were clearly shown to be better able to withstand the conditions of theatre use than magnetic tracks. If you get *old* magnetic-track prints having *good* sound, consider yourself lucky—and thank the projectionists who, having previously used the prints, took excellent care of them.

(*Continued on page* 24)

Carefully kept maintenance records and constructive criticism can help you to do a better projection job.

Two Methods of Improving Projection Technique

By JOSEPH HOLT
Member, IA Local 428, Stockton, Calif.

THERE ARE two valuable aids to better projection that are rarely used, and it is indeed a shame that they are not. I refer first to the practice of carefully logging all maintenance and repair operations in a neatly kept book and, secondly, to the exchange of criticism between projectionists on a mutual basis. Bear with me while we explore the ideal operation of each.

A maintenance and repair log is most important to first-class projection because it enables us to predict breakdowns before they occur. For instance, it enables us to pinpoint the time within a month or two when such items as tracks and shoes need replacing. The same thing is true of sprockets, valve rollers, and lateral guides.

A few moments thought concerning the extra demands we make upon our equipment in CinemaScope and widescreen projection should convince us that it is necessary to replace shoes, tracks, sprockets and rollers long before they are completely worn.

Wear Always Occurs

Let's analyze the matter of tracks and shoes. Every working projectionist knows that the best hardening job will show small ridges and bumps after a year or so. With the use of high-speed lenses, the critical field of focus becomes narrower and the possibility of focus drift is much greater.

In many of the projection rooms I have visited recently, the principal cause of erratic focus was worn tracks and shoes.

In one instance serious focus trouble was being encountered with a make of projector that did not provide doweling of the side guide rails adjacent to the aperature. Troubles seem to come in bunches, for not only did the feature pictures display enormous ability to wander out of focus, but newsreels required refocusing each time a splice went through. Inspection showed that new tracks had been recently installed.

When asked if the manufacturer's gauge block had been used to set the width between the lateral guide rails, I was rewarded with a blank stare. The attitude was: Why should this be necessary when plenty of film was on hand to use for a width setting? Why was it necessary to go to the expense of buying another tool?

The answer is that proper adjustment of the rails and a slight resetting of tension ended all focus trouble in this particular projection room. The rails had been set with a piece of film that was *shrunken* below the normal width of new stock. When new film was being projected, there was a squeezing effect that *forced* the film out of the plane of focus.

Provides Necessary Clue

The source of difficulties such as the above is frequently hard to uncover, and the use of a maintenance log would probably not have prevented the trouble from occurring, but it would have established that the trouble began after the new tracks had been installed, giving a clue both to projectionists and servicemen.

Over a period of years, it becomes easy to spot weak points in equipment if copies of the sound serviceman's reports are saved. I propose that something very similar be done by the projection crew in those cases where the serviceman does not maintain all of the equipment. It is most useful to know, for example, when generator brushes were last replaced, and when generator bearings were last checked and greased.

Above all, a maintenance log provides a reminder chart for the orderly requisitioning of replacement parts. Then, when some part is not giving proper service, it is not left to memory or sad experience to find the offender.

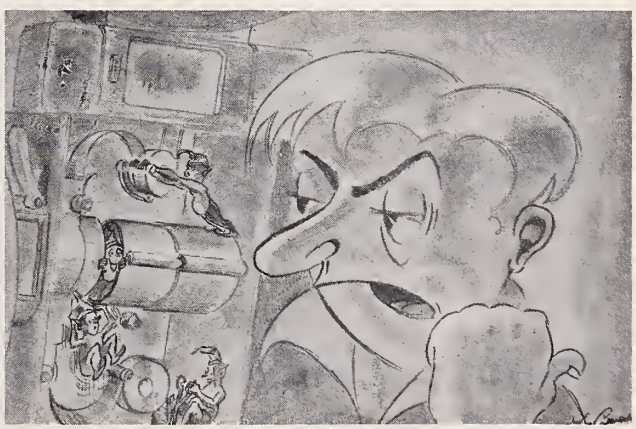
So much for the use of accurate maintenance and repair logs. Now let us go into the matter of mutually arranged criticism between brother projectionists. Let's say that projectionists A and B wish to let each other know how they think projection and sound might be improved at their theatres.

Auditorium Viewpoint

Without any definite appointment as to time, each visits the theatre of the other and sits in the *auditorium* throughout an entire performance. Little or nothing is accomplished by visiting in the projection room. The writer was recently shanghaied into watching a complete show from the projection room at a theatre where there was no program of outside monitoring. I noted none of the following defects which I discovered later by sitting in the auditorium. I was then able to make the following criticism:

(1) The picture was spoiled on one projector by what appeared to be a defective lateral guide roller. Exces-

(*Continued on page 33*)



"I don't care if you and the last projectionist were drinking buddies for *fifty* years, get an IA card or get the Hell outa there!"

Drawing by Ed McCarmack, IA Local 582, Brantford, Ont., Canada

Better Light from HI Reflector Arcs

By ROBERT A. MITCHELL

Continuing demands for more and more light, particularly for the purpose of illuminating giant outdoor screens, inspired this article on a radical new HI reflector arc-lamp system.

LOW-INTENSITY arcs have all but vanished from the field of actively operating theatres — and about time! They are inefficient, converting a large proportion of the electrical energy to heat. Moreover, the yellowish tint of LI illumination is unsuitable for the projection of color films.

One of the good features of the LI arc lamp, however, was the uniform field of illumination it supplied to the screen. There was no gradual falloff of brightness toward the sides of the screen, nor was there any discoloration of the corners. The "color temperature" of the LI arc was the same at all times, hence changeovers were much less conspicuous than with high-intensity lamps burning small carbons, the focus of which is highly critical.

The reason for the remarkably even light distribution of the LI projection lamp is to be found in the crater-centering core of the positive carbon. This core consists of soft carbon, and hence is slightly less bright than the surrounding thick shell of hard carbon. The higher brightness of the hard shell effectively counteracts the vignetting effect of the "slow" lenses (f:2.5—f:3.5) which were formerly standard equipment.

In comparison with the LI arc, which depends for its light-emitting power upon the incandescence of solid carbon at or near its sublimation temperature (3,670°C. = 6,640°F.), the high-intensity arc produces the brighter, whiter light of thermally excited "rare-earth" atoms supplied by the larger core of the HI positive carbon.

Unavoidable Hot Spot

Unfortunately, however, the center of the HI crater is brighter than its edges, and tends to give "hot-spot" screen illumination with dim and discolored light near the edges of the screen. But the advent of the HI arc (invented by Heinrich Beck in 1913) proved a boon to the motion-picture theatre on account of its economical operation, high luminous efficiency, and the pure white color of its light.

The "simplified" HI lamp using small, non-rotating positives did much to popularize HI screen lighting in the 1930's and make possible the projection of larger, brighter pictures in full, natural color. And in more recent years, the drive-in and the use of wide screens in nearly all theatres resulted in the development of 75—180 ampere HI mirror lamps burning rotating positives.

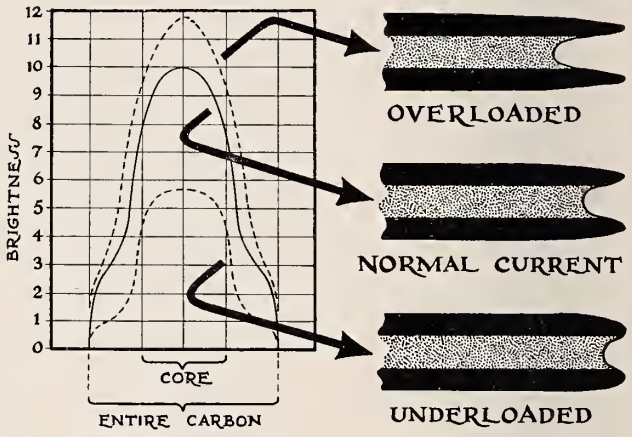


FIG. 1. Distribution of brightness across the crater of a high-intensity positive carbon when burned at normal, excessive, and deficient current. Note that overloading increases the depth of the crater and intensifies the "brightness peak" at the center.

Uniformity of HI screen illumination still constitutes a problem, but has been considerably improved in lamps of the most modern design by more efficient optics and by controlled thermal modification of the luminous positive crater (i. e. by "mild" water cooling of the positive carbon). The side-to-center distribution of only 60—70 per cent with "Suprex" lamps, and of 55—65 per cent with the first post-war rotating-positive HI mirror lamps, has been increased to 70—80 per cent in the more powerful reflector lamps of 1956.

The intrinsic brightness of the old LI positive crater is 175 candles per square millimeter, a high luminosity in comparison with the heated tungsten filament of a mazda projection bulb (about 30 candles per mm²), but much lower than the intrinsic brightness of HI craters, which range from 500—700 candles/mm² in low-amperage "Suprex" arcs to 800—1,500 candles/mm² in high-amperage rotating-positive arcs burning the new regular carbons.

Illumination Gain

Also worthy of note is the vastly greater *total luminance* of the newer lamps—from 30,000 to 50,000 screen lumens for the latest reflector lamps and 15,000 to 25,000 lumens for earlier post-war reflector lamps, as compared with 12,000—22,000 lumens for condenser lamps, 6,000—12,000 lumens for "Suprex" lamps, and 2,000—5,000 lumens for LI lamps, both condenser and reflector.

But despite the factors of whiter light and increased light output at a lower cost per lumen, only the most light-hungry drive-in theatres having screens from 60 to 140 feet wide can tolerate side fadeaway and discolorations. The screen-illumination requirements of most indoor theatres include *quality*

Some Words of Caution

In the article beginning on this page, Mr. Mitchell gives a theoretical evaluation of a new idea for obtaining more and better-distributed screen light by "souping up" modern reflector lamps through the use of 13.6-mm carbons, fast optics and amperages as high as 160. It is necessary, however, to caution the reader that this idea, although promising, is still too new to have been exhaustively tested in practical theatre use.

as well as *quantity*—plenty of light, yes, but also pure white light which is at least 80% as bright at the edges of the screen as at the center, and without brown or violet colorations.

No one, however, would be willing to return to feeble LI arc lighting just to obtain even screen illumination. Even the lower powered "Suprex" lamps are not adequate for widescreen projection, which requires from two to three times the light used for normal-format pictures having the same height on the screen!

Better Distribution

A particularly urgent order of business, accordingly, is the improvement of the uniformity of HI lighting, and not by the designers of new lamps alone, but also by projectionists who must still get by as best they can with "Suprex" and other obsolete types of HI lamp. *Nothing less than a side-to-center distribution of 80% should be tolerated in any indoor theatre!* CinemaScope, especially, requires a high degree of brightness uniformity over the surface of the screen to counteract the vignetting effects of anamorphic attachments.

Figure 1 shows the distribution of brightness across the craters of normally loaded, overloaded, and underloaded HI positive carbons. Note that a "brightness peak" is present in all three cases, and that excessive current accentuates this peak. Note, also, that

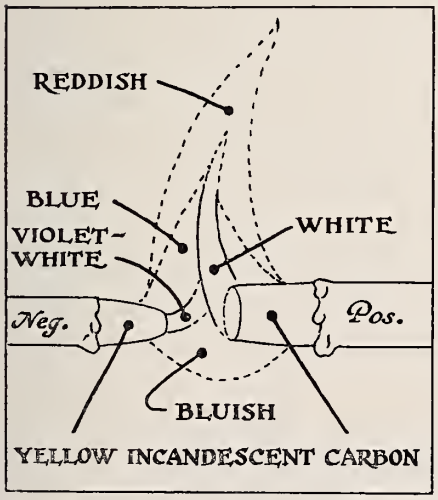


FIG. 2. Color zones in the high-intensity arc. The simplified HI arc, in particular, must be accurately focused for a bright, pure white light on the screen. If the positive crater be too near the mirror, the light will be the yellowish-brown of incandescent carbon; if too far from the mirror, the light will have the blue-violet color of the dimly glowing "envelope gases."

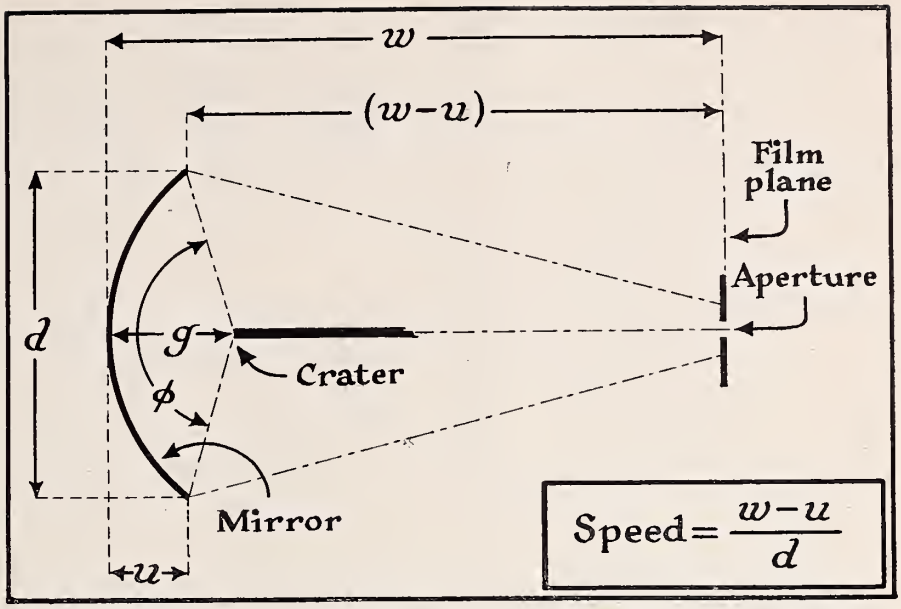


FIG. 3. Specifications of the conventional reflector-arc optics. The angle ϕ is the light-pickup angle of the mirror, *g* is the geometric focus (crater-reflector distance), *u* is the depth of the center of the mirror, *d* is the mirror diameter, *w* is the working distance (reflector-aperture distance), and *w-u*, a quantity employed in optical-speed calculations, is the working distance *minus* the depth of the mirror. A knowledge of each of these factors is extremely helpful to the projectionist. Several of them may be computed with the aid of formulas given in the accompanying article.

only the core section of the crater face produces pure white light: the incandescent shell of hard carbon gives a yellowish or reddish light.

Correctly designed HI lamps project upon the film aperture of the projector a crater image, or "spot," large enough to place all of the reddish shell light *outside* the actual aperture area. In this way the aperture is illuminated entirely by white core light; and the distribution of light on the screen is very much improved.

A good method may be carried too far, of course; and if the spot be made too large, a great deal of light will be wasted upon the cooling plate of the mechanism, and the screen image, though evenly illuminated and perfectly white, will not be bright enough.

Many simplified HI lamps burning small 6-mm, 7-mm, and 8-mm positives actually project an aperture spot which is too small. The hot-spot effect is extremely troublesome when such lamps are adjusted for "maximum screen light." In practice, therefore, the spot is "defocused" to some extent by moving the crater either closer to the mirror or farther away from it than is warranted by either the focal length of the mirror or the mirror-aperture distance ("working distance") employed.

As every projectionist knows, removal of the positive crater from its correct focal position not only wastes light, but also discolors it. If the crater be too close to the reflector, brownish shell light will supply most of the screen illumination. If it be too far away from the reflector, the screen light will come from the blue-violet "envelope" gases. A bluish discoloration is preferable to a yellowish one; but the fact that a lamp *must* be defocused slightly to attain the minimum side-illumination falloff represented by 80% side-to-center distribution shows very plainly that something is radically wrong with the optical design of the lamp.

Any arc-lamp reflector has one definite focal length and one particular type of elliptical curvature to enable it to function best at one particular distance from the projector aperture. The manufacturer of the lamps you are using specifies this working distance—the distance from the center of the mirror to the center of the aperture—in his instruction manual. An inch or two of departure from the specified working distance is allowable; but too great a departure may result in an inefficient, out-of-focus spot.

Check Working Distance

In any case, it is a good idea to check up on the working distance, measuring it carefully; for you may be losing light (too great a working distance) or obtaining a hot-spot with

discolored screen corners (too small a working distance). Too small a spot may cause blistering of black-and-white emulsion at the center of each frame when the lamp has an optical speed of *f*:2.5—*f*:1.9 and the current is in excess of 75 amperes.

How large should the aperture spot be?

The diagonal of the normal 0.825″ x 0.600″ aperture is almost exactly 1 inch: the diagonal of the 0.910″ x 0.715″ CinemaScope aperture is nearly 1 1/5 inch. It is thus obvious that the diameter of the spot must be *at least* 1¼ to 1½ inch, and it is equally obvious that the spot must include only the *brilliant white core light*, not the reddish shell light.

The size of the *usable* spot, therefore, is the size of the positive core multiplied by the magnifying power of the mirror. The diameter of the core of a regular HI positive is approximately ½ the diameter of the carbon, hence in the case of an 8-mm positive, the core diameter is 4 mm = 0.16″.

A certain popular simplified HI lamp burning coppercoated positives has a "geometric focus" of 4 inches; that is, the positive crater is placed 4 inches away from the center of the mirror. The recommended working distance is 34 inches, and its true focal length is 3.6 inches.

$$\text{Focal length} = \frac{wg}{w+g} = \frac{34 \times 4}{34+4} = 3.6''$$

$$\text{Geometric focus} = \frac{wf}{w-f} = \frac{34 \times 3.6}{34-3.6} = 4''$$

The magnifying power of the mirror at the 34″ working distance, therefore, is:

$$m = \frac{w}{g} = \frac{34}{4} = 8.5''$$

The diameters of the aperture spots may now be found by multiplying the core diameters of the positive carbons used in this lamp by the magnifying power of the mirror.

It can be seen from Table 1 that only the 8-mm and 9-mm positives offer some degree of assurance of a spot large enough to cover the CinemaScope aperture without discolored corners or excessive fadeaway at the sides of the screen.

TABLE 1

POSITIVE CARBON DIAMETER	DIAMETER OF CORE	DIAMETER OF APERTURE SPOT
6 mm	0.12″	1.0″
7 mm	0.14″	1.2″
8 mm	0.16″	1.4″
9 mm	0.18″	1.5″

Certain other simplified HI lamps are less fortunate in this respect because their mirrors do not have sufficient magnifying power at practicable working distances. There is also the danger of obtaining mottled light with increased working distances when carbons as small as 6 mm and 7 mm are used. The mottling is caused by the combination of a small light source and slight irregularities in the curvature of the mirror.

A few of the newer lamps employing 16-inch mirrors and 9-, 10-, and 11-mm rotating positives admittedly project aperture spots that are excessively bright at the center of the projector aperture, but dim and discolored at the corners and sides. In general, these newer lamps work at a mirror-aperture distance of about 34 inches. Their mirrors have a geometric focus of about 6.4 inches and a magnifying power of 5.3. Hence:

Avoiding Film Damage

Use of these positives in lamps of this type necessarily results in hot-spot projection. As a matter of fact, 16-inch mirror lamps burning 9-mm positives at about 85 amps. have caused at least as much film damage as more powerful lamps burning larger carbons and producing from 2 to 2½ times as much total screen illumination. The concentrated 1-inch aperture spot produced under these conditions has an extremely hot center, as is proved by blistered emulsion in the middle of each frame of dense black-and-white prints.

TABLE 2

POSITIVE CARBON DIAMETER	DIAMETER OF CORE	DIAMETER OF APERTURE SPOT
9 mm	0.18″	1.0″
10 mm	0.20″	1.1″
11 mm	0.22″	1.2″

Users of such lamps may prevent film damage and obtain more even screen light by moving the mirror (or the entire lamp) from 2 to 6 inches farther away from the picture mechanism, taking care not to produce a spot so large that light is wasted and the mechanism overheated by the spill light.

Suppose a 10-mm positive is burned (90—105 amps.) in a lamp having either a 16- or an 18-inch reflector working at 34 inches. At this working distance the aperture spot has a diameter of 1.1″, definitely too small and concentrated. Pushing the lamp ahead 2 inches toward the mechanism makes matters worse by reducing the diameter of the spot down to an even 1 inch. But pulling the lamp back to a working distance of 40 inches—6 inches longer than the optimum working distance—gives a spot 1.3″ in diameter. The center of the aperture and screen will be less bright, but all other areas will probably be brighter and whiter. Only a little of the total light will be lost, and film damage may be completely avoided.

Users of simplified, or "Suprex." HI lamps may find the same expedient useful for correcting dim and discolored corners and side areas. The appearance of mottling must nevertheless be guarded against. The alternative to this procedure is the use of larger positives and more current to give a larger spot.

Technical Confusion

The optical speed of arc lamps has become a sacred cow to the industry in spite of the fact that arc-lamp mirrors and projection lenses having the same speed rating, or *F*-number, *do not* match each other, and in spite of the more significant fact that the angle of light-pickup from the positive crater is as important to arc-lamp efficiency as such numerical tags as *f*:1.9, *f*:1.7, and *f*:1.5.

The speed rating a projection lens must have to match a specified mirror speed is dependent upon the EF of the lens and is given by:

$$F{:}n = \frac{f\,(w-u)}{df + a\,[f + (w-u)]}$$

in which *f* is the equivalent focus of the projection lens, *w* is the center-of-

(*Continued on page* 28)

A Tour of the Photokina

A British expert on projection equipment gives his impressions of the recent photographic show in Cologne, Germany.

By R. HOWARD CRICKS

IN ALTERNATE years Europe's largest exhibition of photography and motion picture equipment, Photokina, is held at bomb-scarred Cologne, in the vast exhibition buildings on the banks of the river Rhine.

For me the chief attraction this year was a demonstration of Todd-AO. Because of a crippling entertainment tax, which on the higher priced seats exacts as much as 45% of the gross takings, it now appears unlikely that we in England shall ever see this system—it would take too long to recoup the initial expenditure (Cinerama, in spite of packed houses, is reported to have taken over a year to break even). For this reason, "Oklahoma!" the first Todd-AO film, is being shown in England with 35-mm CinemaScope prints.

The demonstration at Cologne was arranged by Philips, makers of the combination 70/35-mm Todd-AO projector. The width of the screen across the chord was 43 feet and the height 21½ feet; the depth of curvature was 10 feet. The demonstration started with a sequence which illustrated the limitations of the 35-mm picture, while a German commentator explained the merits of Todd-AO. No doubt the rest of the program has been seen in the U. S.: "The Mystery of Todd-AO", showing the camera, the lens, the sound equipment, followed by a series of shots demonstrating "audience participation": a run on a roller-coaster, the Wyoming mountains seen from a banking aeroplane, ski-ing in Idaho, a traffic cop in San Francisco. Then followed the first reel of "Oklahoma!"

Impressed by Todd-AO

The effect upon the rather stolid German audience was no different from that of Cinerama upon English audiences; they shrieked as the roller-coaster swooped dizzily downhill; they gasped as the plane banked and turned; they shuddered as the motor-cycle chase ended in a collision.

Technically the picture was excellent; the Peerless HI-Candescent condenser arcs gave a remarkably even brightness, which seems desirable with these "engulfment" systems. The six-channel stereo sound was a distinct asset, although, as I shall shortly mention, a few days later my views on setereophony underwent a certain change.

After the show H. L. A. Gimberg, of Philips, showed me the Todd-AO projectors which were described in IP in October of last year. The most striking feature is that, although built to run 35-mm as well as 70-mm film, they are only slightly more complicated than any ordinary projector. The 35-mm sprockets are arranged inside the 70-mm teeth.

The full range of Philips projectors was on view: the FP.7 with enclosed film path, which is installed in a number of English cinemas; the FP.6, with open film path, which is favored in pre-view theatres; the FP.5, the excellent 35-mm portable; and the EL.5000 professional 16-mm projector, with its intermittent sprocket driven by an ingenious drunken-cam mechanism.

Philips showed also a line of tube-type arc rectifiers—the most popular type on the Continent. Only one firm, SAF, showed the more modern selenium type, available in a number of ratings.

So far as 35-mm projectors are concerned, there was not a single example of British or American manufacture, but there was quite a number of machines of Continental manufacture.

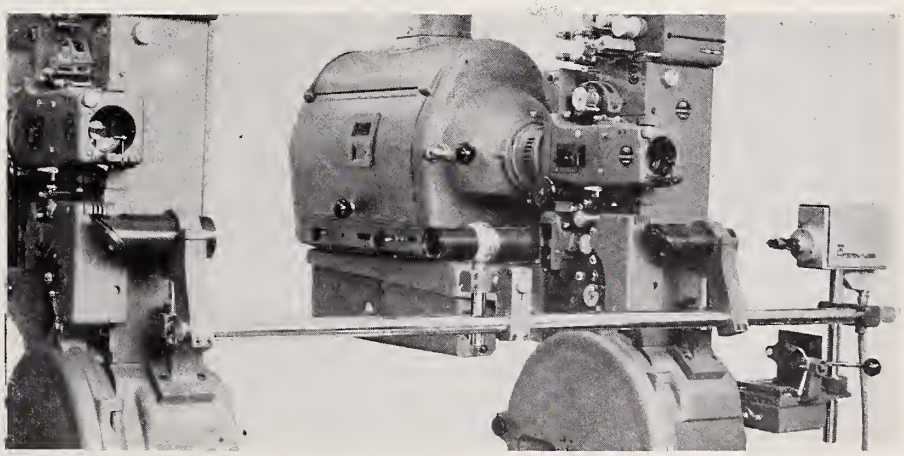
However, projector design seems to have reached a static period, and none of them showed any particularly novel feature. The Dresden is a massive machine which tilts upon its lower magazine. A feature I like in the Frieseke & Hopfner FH.99 projector was that, instead of the film path being enclosed by the usual glazed door, transparent mouldings above and below the gate and lens unit permitted the film path to be easily accessible for threading, and clearly seen when the doors are closed.

The leading Italian manufacturer is Microtechnica, which has an excellent range of equipment. A sturdy rod on which an anamorph can be hung, and also swung out of the beam is provided on this equipment.

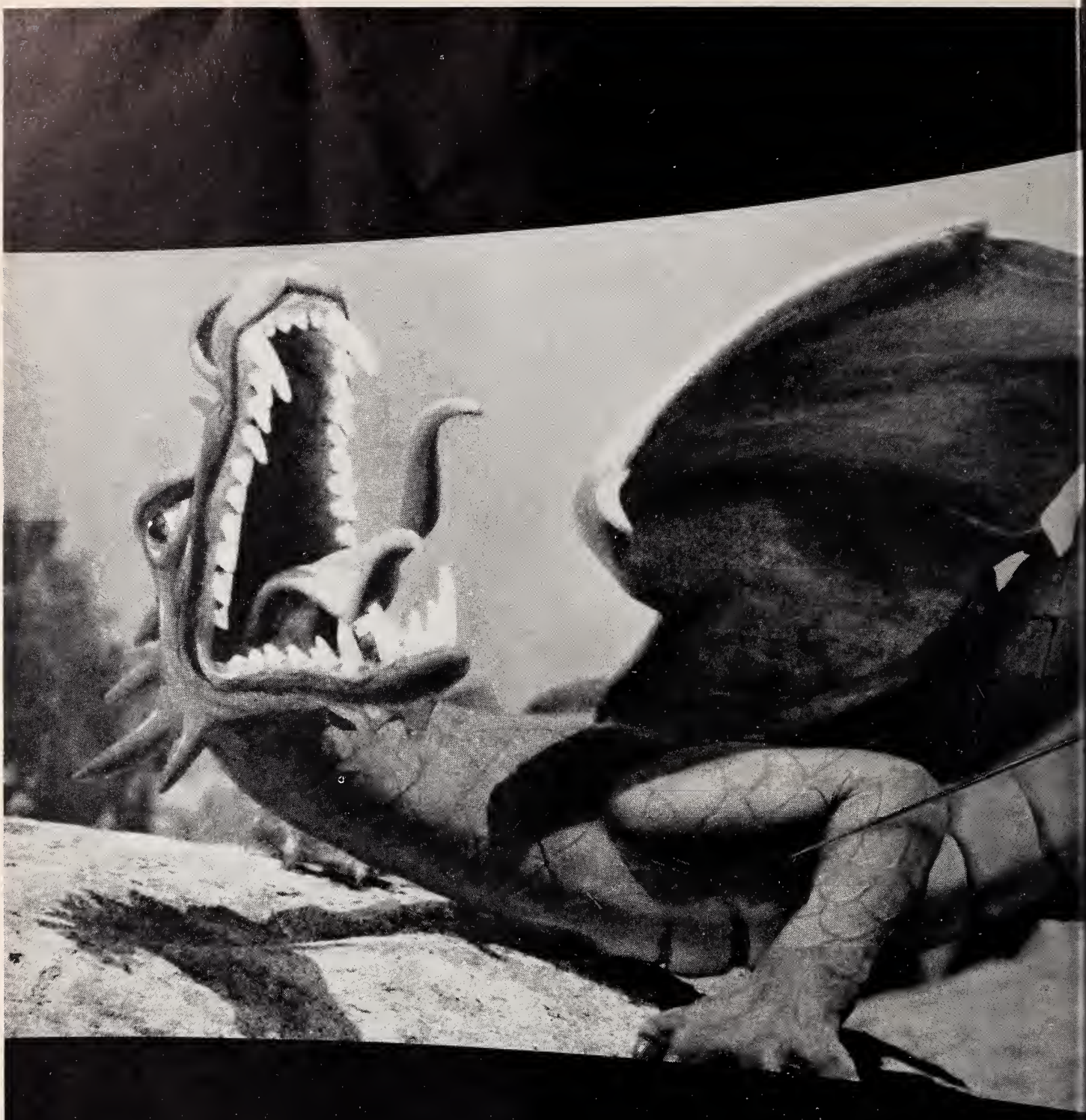
European Soundheads

The American type of optical soundhead, originally built around the Simplex-type projector, is unknown on the Continent; instead, every projector has a soundhead built integrally with the mechanism and of what we used to call the "pull-through" type. Every projector, of course, has its magnetic pent-

(*Continued on page* 30)



One of the few projection innovations displayed at the Cologne Photokina is the Zeiss-Ikon system which combines standard projection with closed-circuit TV. By means of mirrors and prisms, an image from the projection beam of either of the projectors shown above is directed toward the compact TV camera mounted at right in the picture. The tiny angled mirrors which are mounted directly in front of each projection lens are so small as to be almost invisible in the picture above, but the casings for the prisms and corrective lenses can be clearly seen mounted on an aligning rod between the two projectors. Purpose of the system is to enable the theatre to show a TV image of the picture on its screen in the lounge, lobby or other parts of the theatre.



St. George and the dragon

... *Continuous show — entire week*

Battle the wicked dragon . . . save the lady fair! That's what we'd all like to do—and can—on the wide, wide-screen where everything's close-up and adventure's real and earnest. Product of modern

Motion Picture Film Department
EASTMAN KODAK COMPANY, Rochester 4, N. Y.
Branches at strategic centers. Inquiries invited.



motion picture technology, wide-screen movies came about through the close co-operation of industry and such groups as the Eastman Technical Service for Motion Picture Film.

East Coast Division
342 Madison Avenue
New York 17, N. Y.

Midwest Division
130 E. Randolph Drive
Chicago 1, Illinois

West Coast Division
6706 Santa Monica Blvd.
Hollywood 38, Calif.



St. George and the dragon

. . . *Continuous show — entire week*

Bottle the wicked dragon . . . save the lady fair! That's what we'd all like to do—and can—on the wide, wide-screen where everything's close-up and adventure's real and earnest. Product of modern motion picture technology, wide-screen movies come about through the close co-operation of industry and such groups as the Eastman Technical Service for Motion Picture Film.

Motion Picture Film Department
EASTMAN KODAK COMPANY, Rochester 4, N. Y.
Branches at strategic centers. Inquiries invited.

East Coast Division	*Midwest Division*	*West Coast Division*
342 Madison Avenue	130 E. Randolph Drive	6706 Santa Monica Blvd.
New York 17, N. Y.	Chicago 1, Illinois	Hollywood 38, Calif.

In The SPOTLIGHT

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

REMINISCING about the so-called "good old days" is a favorite pastime of many oldtimers and George La Victorie, veterman member of Local 356, St. Paul, Minn., is no exception. He is fond of recalling the days when snatching burning film from the projector, putting out the fire, and then re-threading the same machine with as much of the film as he was able to salvage was all in a day's work in the early days of his career as projectionist.

"The advent of 'talkies' with synchronized sound on records to match the action on the film gave the projectionist plenty of headaches," recalled La Victorie. "I found it quite harrowing at times watching a man's lips moving on the screen and hearing a sweet feminine voice. Also," he continued, "it was pretty distressing when a needle got stuck and the same line was repeated over and over agin." In retrospect such incidents are humorous but in the "good old days" they were quite troublesome, to say the least.

A former official of the Local and chief projectionist at the RKO Orpheum Theatre in St. Paul for 34 years, La Victorie recently retired and plans to spend the next year traveling with his wife. He joined Local 356 in November, 1914, one month after it was chartered by the IA. During the past 30 years he served the Local as president, vice-president, and business representative—holding the latter post for 15 years—and is the recipient of a gold life membership card. George La Victorie has many friends throughout the Alliance and is highly regarded in the industry.

• A highlight of the recent Fall meeting of the New York State Association of Motion Picture Projectionists was an illustrated lecture delivered by Larry Davee, sales manager for Century Projector Corp. Davee's talk covered the latest developments in projection equipment and was well received by the delegates. Brief addresses were also made by Richard Altman of Bausch & Lomb Optical, and by Bill Graham, who was in charge of the Projection Optics Co. exhibit.

Among the invited guests present were James J. Brennan, first IA vice-president; H. Paul Shay, 10th District secretary; Arthur Meyer, vice-president, International Projector Corp.; Paul D. Ries, National Carbon Co.; Jerry George, Buffalo branch manager for National Theatre Supply; Roy J. Fisher, Fisher Mfg. Co.; Edward J. Dougherty and Jacob Winick, past presidents of the 25/30 Club of New York, and Morris I. Klapholz, Club secretary.

• Leon Burton, financial-secretary for Local 253, Rochester, N. Y., for the past 38 years, was awarded a gold life membership card upon his recent retirement from office. The presentation took

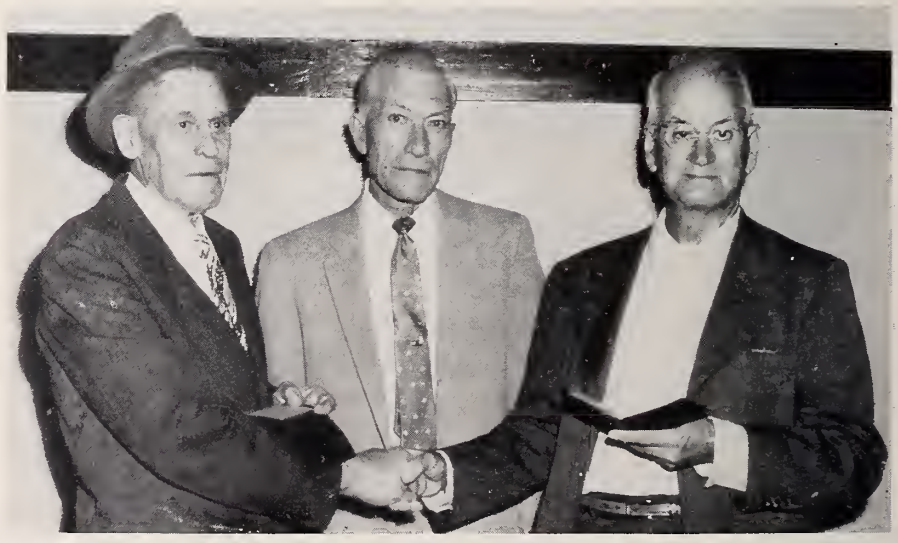


Fred Baekhout (right), business representative for Rachester Local 253, holds the gald life membership card he is obout to present to retiring official, Leon Burton (center). Louis Levin (left), president of the Local, taak port in the presentation.

place at a breakfast party tendered in his honor at the 277 East Avenue Restaurant in Rochester, which was attended by 40 members of the Local in addition to a number of invited guests. Fred Boekhout, business representative, made the presentation on behalf of the Local.

A 50-year projectionist, Leon Burton began his career in Auburn, N. Y. back in 1906, moving to Rochester in 1909. He was a member of the Rochester Local when it was granted an IA charter in 1912, and six years later—in 1918—he was appointed to the office of financial-

IA LOCAL 248, DAYTON, OHIO HONORS TWO LONG-TIME MEMBERS



Elmer Badertscher (left) ond Eugene Woods (right), veteran members af Lacol 248, are shown halding the life membership cards presented ta them by the Lacal's president, Frank Schommer (center). Badertscher jained the union July, 1918. Waads is a charter member af the Lacal which was faunded back in May, 1912. Bath men were employed at the Colanial Theotre in Daytan until their recent retirement.

secretary, a post he held continuously until his recent retirement.

Burton holds the almost unbeatable record of never having missed a Local meeting in the 38 years he held office. For the past 18 years he worked as projectionist at the RKO Palace Theatre. Now that he has retired, Burton plans to devote much of his time to traveling—that is, when he is not indulging in his favorite pastime of playing the role of adoring grandfather to his three grandchildren.

• A record turnout of more than 500 attended the recent 30th anniversary celebration of Local 640, Nassau & Suffolk Counties, N. Y., which was held in the main ballroom of the fabulous Casa Seville, in Franklin Square, L. I. Richard F. Walsh, president, and Robert MacGregor, president of the Nassau-Suffolk Labor Council, were guests of honor.

A feature of the evening was the presentation of solid gold life membership cards to Frank S. Cummings, who has served as Local 640 president for 30 years, and to Wm. Nagengast, long-time business representative. Solid gold watches were presented to the following Local officials: Julius Carle, vice-president; Pierre Jelis, vice-president, and John Seyferth, financial-secretary.

Top entertainment and dancing until the wee hours of the morning rounded out the evening's festivities.

• Albert Goldman, member of Boston Local 182, will be installed the latter part of this month as commander of the Lt. A. Vernon Macauley Post No. 270, theatrical post of the American Legion. Goldman has served on a number of Post committees.

• The voluntary contribution to the Committee on Political Education (COPE) at the recent Kansas City convention amounted to $739.21.

• C. F. Odenwald, former official of Local 339, Missoula, Mont., was recently presented with a gold life membership card in recognition of 30 years' service to the Local as business representative and secretary.

GUESTS OF HONOR AT LOCAL 640 ANNIVERSARY PARTY



Local 640 (Nassau & Suffolk Counties, N. Y.) officials and guests of honor at the recent 30th anniversary celebration. Left to right: Frank S. Cummings, president of the Local; Richard F. Walsh, IA president; Robert MacGregor, president of the Central Trades and Labor Council of N. & S. Cos.; and William Nagengast, business representative for 640.

• We add the name of Bender A. Cawthon, member of Local 511, Jacksonville, Fla., to the list of IA members who have made a hobby of collecting motion picture projection memorabilia. We understand that Cawthon's collection is quite extensive and there is a possibility that it may be placed on public exhibition in the not too distant future.

• We were pleased to learn that Genaro G. Garcia, former president of San Antonio Local 407, has recovered from a recent heart attack and is back at his old stand in the projection room of the Majestic Theatre there.

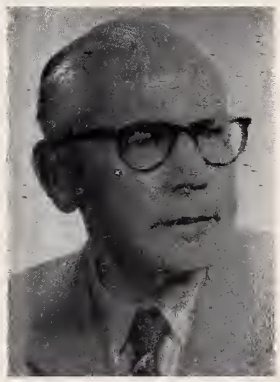
• Our very best wishes to Anthony Boscarelli, president of the 25/30 Club, who left our shores for an extended vacation abroad.

• Pulling the fourth largest vote in a roster of eleven candidates running for the St. John city council, James A. Whitebone, (no stranger to these columns), business representative for Local 440, St. John, N. B., was one of six elected to the council.

• We were sorry to learn that George Spicer, member of Pittsburgh Local 171, suffered a heart attack as he reported for work at the Fulton Theatre. He has our best wishes for a complete and speedy recovery.

Dr. Ernemann, of Zeiss, Dies

Dr. Alexander Ernemann, a pioneer in the projection field died last month in Stuttgart, Germany, at the age of 79. He belonged to a generation that took part in the development of motion picture technique from the beginning.



•

The late Dr. Alex Ernemann

His career in motion pictures began in 1904 when he joined his father's firm. That was the time when the Ernemann works was changing over from the original joiner's workshop into a modern factory for motion picture and photographic equipment. He became a managing director of the Ernemann firm in 1910, and a director of Zeiss Ikon AG., Dresden, in 1926.

He is credited with creating the first steel projector, the Imperator, which was followed by a wide line of Ernemann projectors. Among these were the water-cooled projector and one of the first sound projectors, the Ernemann VIII. Just before his death he was made an honorary member of the Society of Motion Picture and Television Engineers, New York.

IA PROJECTIONIST MANS TV STATION IN THE FAR NORTH



•

Gordon H. Dyer (see IP for June, "Letters to the Editor"), projectionist at TV station KFAR, Fairbanks, Alaska, is shown here checking the film to be used for the day's broadcast.

Readers' questions are invited.

Projection CLINIC

Beware of Inferior Projector-Port Glass

TECHNOLOGISTS fuss and fume about the 10% loss of light occasioned by heat filters, but we seldom hear about the 8% to 15% light loss resulting from projector-port windows! Neither do we hear many complaints from lens manufacturers about the distortions caused by inferior or wrongly positioned port glasses. It seems to us that the manufacturers of lamps and lenses should immediately wage war upon the light-wasting, image-blurring glass panes found in the projector ports of innumerable theatres.

The output of the best arc lamps is cut down by low-quality port glass, and the performance of the best coated projection lenses is often ruined at the projector ports. We often find port glasses set flush to the front wall in theatres having a steep projection angle. The resulting refraction of the image-forming beam produces multiple internal reflections that give a "soft-focus" image on the screen.

The lack of antireflection coatings on the port glass wastes a tremendous amount of light. So do the minute scratches caused by years of scouring with Bon Ami, Dutch Cleanser. and other abrasive powders which, though wonderful for cleaning sinks and tile floors, will quickly ruin delicate optical surfaces.

Common Mistakes

It's bad enough to use ordinary window glass in the observation ports; but just think how the image-forming light beam from the projection lenses suffers when plate glass of the type used for store windows is placed in the projector ports! It happens all the time.

Unless drafts draw dust-laden air into the projection room through the portholes, don't use any glass in the projector ports. Dust is a problem in most theatres, however, so port glass *must* be used to protect the projection lenses from excessive dust deposits on their front surfaces. But why take a chance with the quality of your screen image by using ordinary commercial plate glass? Why throw away from 8% to 15% of your light by using uncoated glass? You are presumably using coated lenses, so why counteract the advantages of coated lenses?

Get a pair of *optically* flat plate glasses of high transparency for your projector ports, and be sure that they have high-quality antireflection coatings on both sides. Clean them in the same manner, and just as carefully, as you clean your projection lenses. Guard against scratching them. The light loss will be negligible —about 2% at the most.

Install special frames to hold your projector port glasses in place *and perpendicular to the projector light beam.* The optical axis of the projector should hit the port glass *square!* If you have a 15-degree projection angle, then the port glasses must be tilted 15 degrees. This is an extremely important rule, observance of which will give your picture the maximum degree of clarity, brilliance, and "snap."

Don't Reduce Ballast

IN THESE days of CinemaScope and widescreen, many projectionists have found it necessary to increase arc current as much as possible with the same generator equipment used in the days of normal-format projection. The field rheostats are turned up as far as they will go. Then the ballast rheostats are cut down to provide a minimum of resistance to the flow of current in the arc circuit. But while nothing can go wrong in turning up the field rheostats for the generation of more current, reducing the ballast resistors will make the arcs unmanageable if overdone.

Arc generators for multiple-arc operation must necessarily provide a constant voltage at all loads, otherwise the arc burning in the working projector would snap out the moment the arc in the other machine is struck in preparation for the changeover.

The carbon arc, however, has a *negative coefficient of resistance*, as do all gaseous conductors. That is to say, the arc stream of hot gases lets more and more current pass as the temperature increases. And more current, naturally, raises the temperature of the arc stream still more, allowing more current to flow, etc. etc. Without some means of regulation, the generator quickly becomes overloaded. One of two things will happen: the fuses will blow or the field of the generator will collapse because of demagentization. The output of current stops in either case.

Regulation Essential

To keep the current-hungry arc under control, a ballast resistor is used to *limit* the amount of current that the greedy arc can get. With the ballast connected in series with the arc, the arc can get, at most, just so many amperes *and no more!*

Suppose, now, that the ballast rheostat is cut down too much. The arc can then get too much current. When this happens, the output of the overloaded generator becomes erratic. The arc flickers and threatens to snap out. The carbon-feeding mechanism gets so confused that the arc gap varies in length for no apparent reason. And the projectionist, if he doesn't understand all this, may blame the carbons, the lamp, the generator, or the power-supply company. He may feel that something needs fixing when, in reality, nothing is wrong that sufficient ballast resistance couldn't cure.

Like a pair of lovers who have elected to live with each other, a generator and an arc must be "compatible." When there isn't enough ballast in the circuit, the lamps experience a sort of electrical nervous breakdown due to the inability of the generator to satisfy their need for a *steady* supply of current. The poor little generator, all hot and bothered, may blow a fuse or give up altogether. So don't cut out so much of the ballast that the arcs become unruly! If there still isn't enough light on the screen, more powerful generators are needed.

Improved Technicolor Process

Technirama, a photographic and film-processing system designed to supply improved prints for big-screen projection, has been announced by the Technicolor organization and will shortly be available to film producers.

The Technirama camera employs a standard 35-mm negative which moves horizontally through the camera, exposing a large film frame eight perforations in length. The size of the film frame is similar to that obtained with the horizontal-action VistaVision camera, but a partial anamorphic squeeze takes place. The Technirama processing is designed to provide both anamorphic and non-squeezed prints for theatre projection, and also 16-mm prints.

Genarco's New AC Arc Spotlight

The new AC arc spotlight marketed by Genarco, Inc. is based on a design originally developed by the firm for the U. S. government. Although simple to operate, this lamp differs considerably from spotlight equipment now installed in theatres.

Two 7-mm copper-coated carbons are placed side-by-side at the angle shown in Fig. 1. As the carbons have the same diameter and since they are burned with AC current, their tips have the same brightness. Both tips are directed toward the reflector. According to J. P. Latil, president of Genarco, the light emitted is far greater than with AC arc lamps where the light emitted by one carbon tip is used and the other one is lost.

The gap between the carbons is very short, 1/64th to 1/32nd of an inch, and the current is 60 amperes. With a gap of 1/64th inch between the carbons, the arc voltage is 20 volts. As the arc operates after the feeding action stops, the gap increases slowly to 1/32nd inch while the arc voltage reaches 21 volts. A relay is then tripped and a motor

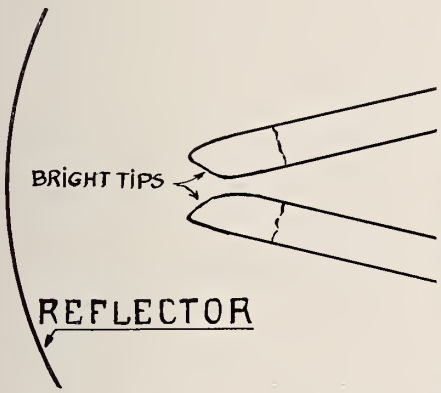


FIG. 1. View from top of the Genarco Super Ace arc spotlight which operates on AC current and uses two 7-mm copper-coated carbons placed side by side at an angle of 24 degrees in front of the reflector.

feeds the two carbons to reduce the gap to 1/64th inch and the voltage to 20 volts. Thus, the feeding is intermittent with the motor operating every 15 seconds. No part moves in the lamp during the interval.

Since the two carbons are fed simultaneously and equally, the focusing of the arc is always assured geometrically by the operation of the voltage differential relay, and operation is therefore automatic, Mr. Latil states. The projectionist does not have to feed the carbons or focus the arc.

An original method for striking the arc has been devised. When the projectionist closes the power switch, there is a short gap between the carbons, as is shown in Fig. 2-A. The feed motor bringing the carbons into contact is illustrated in Fig. 2-B. As soon as the

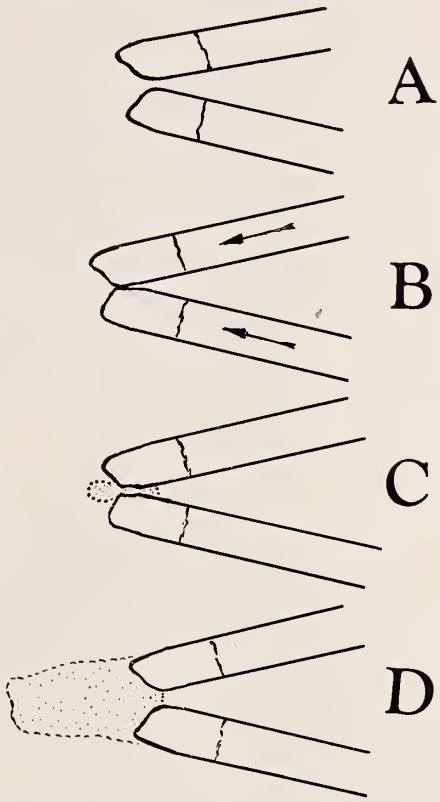


FIG. 2. Illustrated here is the method of striking the Genarco AC arc. At *A* the carbons are connected to AC current but separated. At *B* the feed motor brings the carbons to contact and stops. Black arrows indicate direction of the feeding action. A small amount of carbon matter volatilizes at *C*, the arc strikes at *D*.

carbons touch each other the motor stops. The contact point becomes red, ignites and volatilizes, as is indicated in Fig. 2-C. This creates a gap and strikes the arc. Fig. 2-D shows the gap as it increases until it reaches 1/32 inch, after which the arc control starts to operate. Note that the motor does not pull the carbons away after striking. The gap is burned in the carbons.

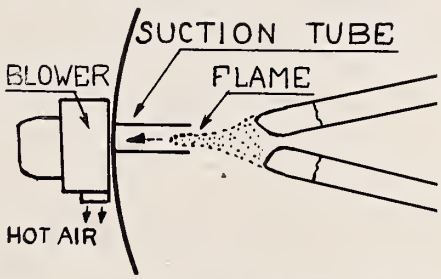


FIG. 3. Another drawing that shows the Genarco AC spotlight viewed from the top but showing the blower sucking the tip of the flame and removing hot air through opening in the center of the reflector.

The Genarco "Super Ace" AC spotlight will operate for 2 hours without retrimming when 12-inch carbons are used, and for 2¼ hours with 14-inch carbons. Smoke and hot gases are sucked out of the lamp by a blower illustrated in Fig. 3. which cools the lamp and helps keep the reflector clean.

SCIENCE NOTES

SECRETS OF THE LATENT IMAGE, which is the unseen picture that exists on exposed photographic film before development, are being probed by means of a new method at Eastman Kodak Co. The method involves applying simultaneous pulses of light and electricity to a silver halide crystal. The extreme brevity of such an exposure enables scientists, for the first time, to study the motion of electrons in the crystal.

* * *

A FLUORESCENT LAMP with double the light output of existing tubes of equal length has been developed by General Electric. This gain in light is made possible by increasing the area of lighted surface, a higher wattage capacity, and a more effective use of the energy within the tube. The new tube is said to produce five times the light per foot of the original fluorescent lamp.

* * *

A NEW INTERFEROMETER that measures changes in angle of arc down to one-millionth of an inch accuracy has been developed by the Bausch & Lamb Optical Co. The device can be rested on its base, side, or end in order to measure alignment of jigs, fixtures, and flat bed surfaces.

* * *

A "SMOKESCOPE," the name given to an optical instrument that determines whether chimney smoke is within prescribed limits of density, has proved more accurate than the measuring method in use for more than 50 years, according to an investigation conducted by the U.S. Bureau of Mines.

* * *

A RAPID DUST-RECORDING instrument has been developed by Kodak to aid in purifying the air in film manufacturing. The new instrument, believed to be the most sensitive of its kind, can detect and record fine dust that is dispersed through a room from the tip of a pencil.

* * *

15 MILLION PICTURES A SECOND are possible with cameras described by Eastman Kodak laboratories. The cameras have film wrapped on a revolving drum or use a rotating mirror principle to achieve "almost fantastic" recording speeds.

MITCHELL ON SOUND

(*Continued from page* 12)

Scratched opticals can, of course, be pretty bad. I have had the most trouble with variable-area tracks. Lateral scratches across such tracks in low-level sequences produce inordinately loud popping and clicking noises. Similar scratches across variable-density tracks are almost imperceptible.

What Is High Fidelity?

A wide frequency range is not quite so important to hi-fi tracks as many people seem to think. Of course, dye tracks for "blue" photocells and silver tracks in the three emulsion layers of dye-coupler color prints are compensated electrically during the re-recording process for high-frequency response. As a rule, only one or two layers are used for printing the sound track in such films, but all three layers together have been used without noticeable loss of sound quality.

In the days of "duplitized" color prints, the soundtrack was usually printed in blue ferrocyanide image for maximum response with ordinary infrared-sensitive photocells, although a few studios employed a red soundtrack image in conjuction with the blue for good response with old-style blue-sensitive potassium cells. (The red track was totally "invisible" to regular photocells, and hence did not make the sound "fuzzy.")

Although properly handled magnetic originals of adequate width are at present the best medium for sound records, further technical development could easily bring optical tracks to a degree of perfection definitely surpassing even the best CinemaScope-type magnetic tracks. I am referring particularly to the push-pull variable-density optical track recorded and reproduced by means of 0.75-mil scanning beams.

Use of Surrounds

We also agree on the use of 4th-channel auditorium speakers for playing phonograph records. You have in your own theatre what I personally regard as the ideal system for presenting good music before the shows and during intermissions.

Of course I said nothing, in the articles in question, about using the surround speakers *in addition* to the main channels for phonograph records, nor can I see any valid argument against using the surround speakers *alone* for this purpose, if there is some good reason for doing so. You speak of 12-inch dynamic speakers as *inadequate* units, yet 90% of the home hi-fi equipment on the market today makes use of 8-inch to 10-inch dynamics for low-frequency reproduction, with 12-inch units reserved for only the most expensive sets, and then only to be used in conjuction with "tweeter" horns for reproduction of the higher frequencies.

Even 6-inch dynamics are fully capable of hi-fi reproduction if you have enough of them to handle your output (15 to 30 watts); and as you go over 10 inches, the need for separate tweeters becomes really urgent—if you are interested in reproducing frequencies over 6,000 cycles!

As orginally designed, 4th-channel CinemaScope speakers were intended only for the reproduction of off-stage music and noisy sound effects. A wide frequency range had to be covered; but the higher frequencies (4,000 to 10,000 cycles) were not considered too important. In fact, the 10,000-cycle control frequency for this channel is *not* reproduced!

The surround speakers, then, are essentially low- and middle-frequency reproducers, ideal for music. The cabinets for the speakers may be very small when positioned on the wall because the wall, itself, contributes to the baffle area. A 12-inch speaker is nowadays regarded as a *large* speaker, and best suited for use as a low-frequency unit. This one point is probably our most serious disagreement.

Suppose, just for the sake of illustration, that the surround speakers are 6-inch dynamics of relatively low power capacity. If 12 output watts must be divided up among 3 or 4 auditorium speakers, then to use these alone for record reproduction would occasion difficulties only if the volume is pushed too much. But in most theatres, you'll agree, overture and intermission music is played at "background" level, that is, very softly. If records are played at full volume for "canned concerts", then use of the main speaker channels becomes mandatory. Addition of the surround speakers at a "just barely discernible level" is optional in such a case, although undoubtedly desirable.

Use of the CinemaScope speakers for record reproduction has been discussed from the technical angle by Joseph F. Holt in the January 1956 issue of IP ("Non-Sync Reproduction Through Surround Speakers," p. 10 *et seq.*)

What Is Stereosound?

Before saying anything about CinemaScope stereophonic reproduction, it might be well to state categorically that playing single-channel records (disk or film) through several speaker channels is *not* stereophonic sound! It is still "single-channel," but the reproduction has been "accoustically modified" to provide natural "presence" and concert-hall "brilliance." The result may be even more natural-sounding and more pleasing than actual stereophonic reproduction from either multiple tracks or single tracks with pan-pot switching.

Just because music "sounds better" when played a certain way does not necessarily mean that high-fidelity reproduction is involved. In fact, multiple-speaker reproduction may occasion a rather considerable departure from rigorous hi-fi standards, and yet seem more natural. An oscilloscopic pickup of the reproduced sound may reveal echoes, time-lapse transients, and acoustic cross-modulation effects almost too complex for analysis. Believe it or not, hi-fi reproduction requires a single sound-wave source (speaker) and an acoustically dead chamber! Such reproduction is usually far from pleasing.

Stereophonic sound is one of the most disputed topics in the entire field of sound engineering. There is, in fact, little meaning to the term "stereophonic" beyond the obvious implication of multi-

PERSONAL NOTES

THOMAS P. WYNKOOP, Jr., Rear Admiral U.S.N. (ret.), has been elected vice-president of RCA's Commercial Marine Distribution. Since 1949 Admiral Wynkoop has been president of Radiomarine Corporation of America, a whol'y owned subsidiary which was recently merged into RCA. He joined RCA upon his retirement from the Navy where his assignments included eight years in the Navy Department in Washington, and duty in some of the Navy's largest shipyards. Admiral Wynkoop will be responsible for the coordination of commercial marine distribution activities throughout the corporation.

* * *

S. M. ANDERSEN has been named purchasing agent for Altec Lansing Corp. at the company's manufacturing plants, Beverly Hills, Calif. Andersen was formerly merchandising manager of Altec Service Co. in New York. He is a veteran member of Altec personnel, joining the firm in 1930, and has held various executive posts since then. In company with his wife and daughter, he has now taken up residence in Los Angeles.

* * *

LELAND B. PRENTICE has been appointed acting director of research for the Technicolor Corp. With the organization for 26 years, Prentice formerly occupied the post of plant manager. He will now direct the activities of the Technicolor Central Research Laboratory and will serve as chairman of the company's research steering committee. His headquarters are in Burbank, Calif.

channel reproduction. But stereophonic reproduction requires a stereophonic record, or at least some direction-modifying control of the reproduction process.

Truly stereophonic CinemaScope *recording*, done only in the case of a few special full-orchestra sequences, makes use of three microphone channels and, in reproduction, three speaker channels. The results have been disappointing, and unaccountably so since the purely artificial pan-pot method of recording CinemaScope stereosound from a single-channel record gives results which seem much more "stereophonic"!

It it true, unfortunately, that the large majority of moveiegoers are indifferent to stereophonic sound. *Good sound* is mandatory; but the average theatre patron, wearied by the inane bleating of TV, seems to appreciate *less sound* while demanding *better sound*. As provided *via* wide-range multi-speaker systems, better sound is welcomed by the patrons of almost any theatre.

In the East, at any rate, auditorium sound effects, particularly when used to excess, are most often received with disfavor. The average patron seems irritated by hissing reminders from behind, above, and all around. There can be no relaxation for theatre patrons surrounded by a battery of loudspeakers, each one aimed at his head and ready to blast his eardrums with every auditory insult from the banalities of florid movie music to the hubbub of Technicolor battles!

TOLER ON SOUND

(*Continued from page* 12)

any, he should be aware that the speakers used for surround are at best 12-inch dynamic speakers in small baffles which, for straight reproduction would be quite a letdown compared with large stage horn systems. Add to this the confusion caused by those theatres that play optical but advertise stereophonic sound. It is no wonder magnetic is taking a beating.

Now, Mr. Mitchell, don't come back at me with the accusation that I, myself, admitted the surround speakers were lousy for reproduction. I do admit it if they are played alone. However, they merely supplement the stage horns for effect. They are not intended to carry the full sound load. In fact, they are most effective when just barely discernible to the ear—when they cannot be located but are "just there."

Satisfying to the Ear

As for 3 stage channels: I do not believe these can be singled out in any theatre from half way back in the auditorium. Yet for music they add so much

1st Choice

for the PRIME LENS

SUPER SNAPLITE



8 out of 10 Exhibitors today choose a Kollmorgen Super Snaplite for their prime lens. Perhaps this is because for more than thirty years Snaplites have been the standard by which all other lenses have been judged.

For speed, for contrast, for definition and for terrific brilliance on the screen, your 1st Choice is a Super Snaplite.

Write for Bulletin 222.

KOLLMORGEN Optical CORPORATION
NORTHAMPTON, MASSACHUSETTS

more to the richness and fullness of the sound. Several houses in California switch on all 3 horn systems for all title music, and a few use all 3 horns on everything, including speech, when playing optical sound. I will lay odds that your patrons could not tell you from what side of the screen the sound is coming if you turn off the picture and let them listen from half way back in the theatre to a magnetic print with voice coming separately from each speaker. Now this certainly is not in defense of stereophonic sound, is it? Yet I'll lay odds that you can run an optical track over the center horn only and they (patrons) will tell you that the magnetic sounded far better to them.

My wife is no hi-fi fan, but she can walk into a theatre and tell me immediately whether magnetic or optical sound is being used. Mr. Mitchell, can you honestly say that you would rather listen to music on an optical track than on a magnetic track—4-track CinemaScope, that is?

What you say concerning the wear and adjustment of clusters is probably right but that is such a small matter if you can really afford stereophonic sound.

About the tracks losing the highs—I recently started using early magnetic prints for kiddie shows on Saturdays. From the condition of the picture on the screen I expected that the optical track would sound like thundering herds in a rainstorm. Yet, to my tired old ears (I'm 42) the sound was just as sharp as the original run.

Anyway, I have doubled my grosses since going magnetic. My business increased at a time when all Bay area theatres were suffering a slump during the first of this year. True, it wasn't all due to magnetic sound. But a lot of it was. My wife runs the floor (I operate most of the time—have to keep going) and she heard a lot of favorable comment about the sound.

Another thing that helped was plenty of showmanship in presentation. I have a three-deck Brenkert F-3 that I made from two-double-deck units. The top deck is matted out to surround a small 1:66 picture for coming attractions with colored effects covering the balance of screen not covered with picture. An old trick I saw as a kid in the big L. A. houses in the days of true show business. The bottom deck is for slides only and puts a dater across the bottom of the color border while trailers are run. The center deck covers the whole stage with colored effects. My house is small enough to convert these units to 1500 watt mazda and get enough light to suffice.

Non-Sync Records

I use hi-fi records only. Never any juke box stuff and never anything with a vocal. My best records are of the New York Paramount organ played by George Wright, also the San Francisco Fox organ. I use GE Variable reluctance cartridges and 33 1/3 long playing records rather than 45s that change each number or two with plenty of pickup noise during the change cycle. I bring in my surround speakers to reinforce my stage unit while playing these organ records, and damned if you wouldn't think I had the organ installed here. Patrons stop to comment on this too. Total strangers walk into the projection room and ask about the records.

Back to business again (I stray often when on the subject of presentation. Wish Robert Mitchell would write another article on that soon.) I vary my picture size on every program at least once between newsreels — cartoons — trailers, etc. Most houses use one size for flat projection and never change it. And this is usually 1:85 to 1 which on reissues plays hell with heads and shins. On CinemaScope they use 2 to 1 which I feel is a good ratio. In fact, I use it myself.

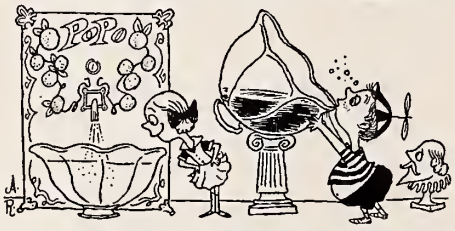
Cartoons and newsreels are run here at 1:35 to 1 with 3½" focus lens. Previews are run 1:66 to 1 with 3½" focus lens with aforementioned border. Features, if of late vintage, are run widescreen 1:66 to 1 with 2½" focus lens or 1:35 to 1 with 3½" focus lens if old.

And on the subject of wide screens—I have a 19 x 33 foot screen in a 50-foot

Your carpets may be the thickest...



Your soft drinks may be king-size...



BUT EVERY PERFORMANCE STILL MUST BE PERFECT!

Perfect performances depend so much on the quality of service your equipment receives. Giving the *best* service is the day-by-day job of every expert RCA Theatre Service Engineer. And he alone has behind him all RCA's tremendous technical resources.

RCA SERVICE COMPANY, INC.
A Radio Corporation of America Subsidiary
Camden, N. J.

Consistent Maximum Light at Greater Economy

DIAMOND PROJECTION CARBONS

70 PINE STREET • NEW YORK 5, N. Y.

auditorium—I am going on out to the walls as soon as I can move two rear exit doors forward. The thing that convinced me to do this was audience reaction to a few tricks I tried on several CinemaScope feature titles where I cut off the title, cast, and director credits to the fadeout. This was on a separate reel (about 3 mins. average) and was scheduled to follow an intermission so that I could set up without rushing too much.

Spectacular Opening

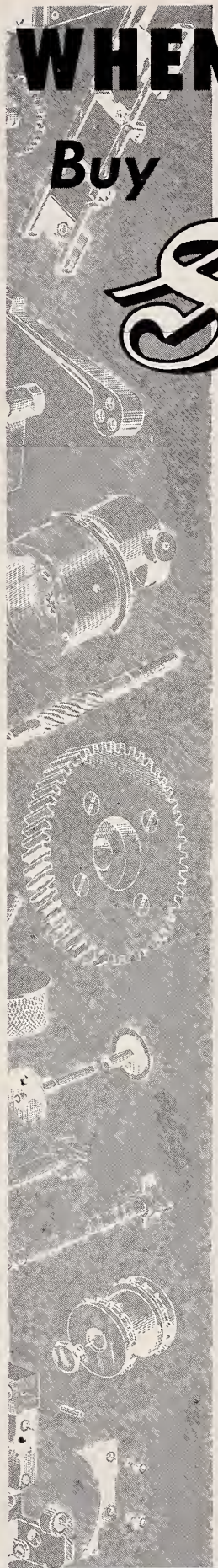
I used my wide-screen lens (2½") as a back element to my Cinemascope lens which threw a picture from wall to wall plus a foot or two, and from floor to ceiling. My side walls taper into a 40-foot stage opening. They are pink in color. My stage drapes are gold satin so that a picture can successfully be projected clear across the front. My favorite opening for this setup was "Bad Day at Black Rock", which was a helicopter shot of the Santa Fe Chief train in the desert with titles superimposed on it. The result was actually fantastic.

I have Peerless Magnarcs with Huff water jackets pulling 70 amperes on a 9-mm black positive carbon for more than average screen brightness here. I could go to 90 amperes with the same setup. I also use the Huff humidifier in my rewind to iron out warped prints from my drive-in friends.

I have gotten clear off the track from where I started on magnetic sound. However, I am centain that we smaller neighborhood houses with subsequent runs must fight to retain our patrons by providing the best possible presentation. I do not have an art-type patron now although I tried that field too. Frankly, I have a lot of hi-fi patrons and that is where I feel we indoor theatremen have our biggest chance to get the people out of their homes and into our theatres—provided we keep our houses clean and attractive and give the patrons topnotch projection.

As for optical track high frequency reproduction, let me say that many present color prints would not permit highs to ever leave the track with the bleeding some of them arrive with. I was in color work a few years and am familiar with the problem of dyed, double-coated prints. I realize it is not quite the same problem now but I think it is still a factor with 3 layers of emulsion involved.

I heartily disagree with Mr. Mitchell's statement that a trained ear can't tell the difference between good single-channel magnetic and good optical. I feel that stereo sound is a boon to indoor theatres. Although we may disagree on the subject of magnetic *versus* optical sound, I look forward to Mr. Mitchell's very interesting and informative articles.



WHEN YOU BUY...

Buy Simplex

T.M. REG. U. S. PAT. OFF.

Your SIMPLEX Projector Mechanism represents a priceless investment. You bought it after long, careful study because you recognized it as the finest projector on the market.

Don't take chances with such an investment — *the very success of your theatre* depends upon its performance! When spare parts are necessary, insist on the best — insist on *SIMPLEX* parts!

From the smallest stud pin to the largest gear cover, every part is made with the same precision and skill as the mechanism itself. By using *only* SIMPLEX parts, you can be certain of maintaining the high quality of performance that has made SIMPLEX the world's foremost projector mechanism!

Genuine SIMPLEX parts are available only through

N.T.S

Your Guarantee

of Consistent Quality and Outstanding Service

NATIONAL THEATRE SUPPLY • 29 BRANCHES COAST-TO-COAST

BETTER LIGHT FROM HI REFLECTOR ARCS

(*Continued from page 16*)

mirror to aperture working distance. *u* is the depth of the center of the mirror, *d* is the diameter of the mirror, and *a* is the diagonal of the film aperture, *all in inches.*

This equation, explained in the October 1949 issue of IP and mentioned several times subsequently, reveals that a certain *f*:2.5 mirror lamp is not matched by any 4-inch projection lens slower than *f*:1.5, and that a certain *f*:2.0 condenser lamp requires an *f*:1.1 4-inch lens to establish a condition of exact optical match. It is not correct to say that an *f*:1.7 lens matches an *f*:1.7 lamp, or *vice versa*, for such a statement presumes a "pinhole aperture," not a 35-mm film aperture of appreciable size.

Finding Arc-Lamp Speed

F-number speed ratings of arc lamps are interesting even if not conclusive indications of optical efficiency. They are found by dividing the prevailing working distance *minus the depth of the mirror* by the diameter of the mirror. Any change in the working distance necessarily alters the speed rating of the lamp in question.

As an example, consider one of the more efficient arc lamps using an 18-inch reflector which is 4¼ inches deep at its center. This mirror works at any distance from 32 to 40 inches, inclusive, with 34 inches as the optimum.

As Table 3 reveals, geometric focus (the distance from the positive crater to the center of the mirror) decreases slightly with increasing working distance. The optical speed (*f*-number) of the reflector decreases with increasing working distance, but the angle of light pickup increases.

The angle of light pickup by the mirror from the crater (θ) may be calculated by the following trigonometric formula, the symbol tan^{-1} (sometimes written *arc tan*) denoting the inverse tangent of $\frac{1}{2}d/(g-u)$, in which *d* is the mirror diameter, *g* is the geometric focus, and *u* is the depth of the mirror at its center.

$$\theta = 2\left(\tan^{-1}\frac{\frac{1}{2}d}{g-u}\right)$$

Especially interesting are the usable spot diameters obtained with 11-mm and 13.6-mm positive carbons at the various working distances. Considering the aperture coverage required for reasonably uniform screen illumination, and also the loss of light when the spot is too large, the data in the spot-diameter columns show that the working distance should not be less than 36 inches when 11-mm positives are burned, or greater than 34 inches when 13.6-mm positives are used.

Table 3, it may be pointed out, represents a close approximation to the actual optical conditions prevailing in some of the more efficient HI reflector lamps designed for burning 13.6-mm carbons. At a working distance of 34 inches, the red shell light does not pass through the aperture to discolor the screen illumination or to heat the film unnecessarily. The absence of a hot center provides assurance that the film will not be damaged by heat. The high side-to-center light distribution of 80% is the result of the large aperture spot and "mild" water cooling of the positive carbon.

Angle of Carbon Trim

Due to the low trim angle (25 degrees) and to scientific stabilization of the arc, the light output of one of these new lamps is very high, as the following screen-lumen measurements indicate (standard aperture, no film or shutter, dichroic heat filter, *f*:1.9 and *f*:1.7 4-inch coated lenses). The regular 13.6 mm x 18" HI positives used throughout the 135—160 ampere current range are consumed at economically low rates.

TABLE 4

CURRENT Amps.	SCREEN LUMENS F:1.9 lens	SCREEN LUMENS F:1.7 lens	CARBON CONS Inches/hour
135	25,000	28,000	6
140	30,000	33,000	7½
145	35,000	38,000	9
150	40,000	43,000	11
155	44,000	47,000	13
160	48,000	50,000	16

A screen light output as high as 50,000 lumens seems phenomenal. Even 48,000 lumens, the output obtained with the newer lamps burning 13.6-mm carbons at 160 amperes when *f*:1.9 projection lenses are used, represents 50% *more light* than is produced by 11-mm carbons burning 120 amperes in 18-inch mirror lamps! Moreover, as we said, superior light-distribution characteristics with removal of the hot shell light from the aperture area, permits projection of black-and-white prints at these tremendously high light intensities without damage to the film. (It is assumed, of course, that effective heat filters of either the heat-absorbing or dichroic heat-reflecting types are used.)

Ultra-fast *f*:1.7 optics are the secret of the highest light outputs. Not even the newest and most efficient lamps can deliver 50,000 lumens to the screen if old-style lenses are used. In fact, 48,000

TABLE 3

WORKING DISTANCE	GEOMETRIC FOCUS	OPTICAL SPEED	ANGLE OF LIGHT PICKUP FROM CRATER	SPOT DIAM. 11-mm POSITIVE	SPOT DIAM. 13.6-mm POSITIVE
32"	6.5"	F:1.5	152°	1.1"	1.4"
34"	6.4"	F:1.7	153°	1.2"	1.5"
36"	6.3"	F:1.8	155°	1.3"	1.6"
38"	6.3"	F:1.9	155°	1.4"	1.7"
40"	6.2"	F:2.0	156°	1.4"	1.8"

lumens is "tops" with even f:1.9 lenses —and they are certainly plenty fast!

An f:1.7 projection lens has 124.5% the light-handling area of an f:1.9 lens, and should therefore increase the screen brightness by 124½%. But the outer zones of a projection lens receive less light per unit area than the central zones; so instead of an increase from 48,000 to 59,760 lumens when changing from f:1.9 to f:1.7 lenses with the new high-powered lamps, the actual increase is from 48,000 to about 50,000 lumens. (Laboratory measurements indicate 54,150 lumens with f:1.5 lenses.)

The availability of advanced new projection lamps designed and produced by major American manufacturers should furnish food for thought to those exhibitors who are reluctant to replace low-powered, uneconomical arc lamps of obsolete vintage. The performance of old-style lamps may be improved in many cases by thought and care on the part of skilful projectionists; but the old never quite comes up to the new. Today's discriminating audiences demand pictures that are evenly illuminated by bright, flickerless, snow-white light. Good projection is always good business; bad projection, never!

[THE END]

Manual Covering Xenon Lamps

A new manual on short arc lamps, which explains their application in projection, searchlight and optical service, is available free from the Lamp Division of the Westinghouse Electric Corp., Bloomfield, N. J. The booklet describes the various types of short-arc lamps, including mercury and mercury-xenon, and lists their applications. Also provided are diagrams of the various types of lamps, graphs of typical arc brightness curves, operating instructions and other technical data.

Short arc xenon lamps are now coming into use with portable 16-mm projectors because of their greater light output as compared with the usual 1000-watt tungsten light source.

Technicolor Expansion

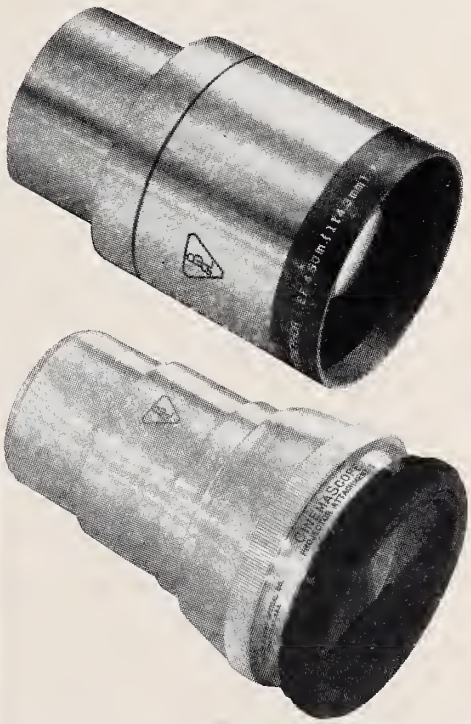
In a recent move to step up its diversification program begun in 1955, the Technicolor Corp. has acquired the business and assets of Pavelle Color, Inc., of New York, processor of amateur color film. The Pavelle plant of Technicolor will in the very near future offer complete color film processing services to amateur photographers in the eastern and midwestern United States.



Scene from "Anastasia," 20th Century-Fox CinemaScope production.

Make your theatre HABIT-FORMING with the

PERFECT-PICTURE PAIR



PERFECT-PICTURE PRIME LENS

Sure, a good feature will bring patrons in . . . but it's how well they see it that helps decide whether they'll pick *your* theatre to come *back* to. Build repeat patronage with B&L Super Cinephor Projection Lenses—full detail, brilliant contrast—the quality standard prime lens for all theatre and drive-in projectors.

PERFECT-PICTURE CINEMASCOPE LENS

Clearest, brightest, distortion-free projection of all anamorphic process films. Highest light transmission —92%! No vignetting! Uniform light and uniform magnification throughout entire screen area! Complete line—neighborhood theatres to longest-throw drive-ins.

SEE THE BIG DIFFERENCE . . . FREE DEMONSTRATION

Write today for demonstration, and for Catalogs E-123 and E-141. Bausch & Lomb Optical Co., 61611 St. Paul St., Rochester 2, N. Y. (In Canada: General Theatre Supply, Toronto.)

Academy of Motion Picture Arts and Sciences
Honorary Award for Optical Service to the Industry

BAUSCH & LOMB

SINCE B&L 1853

©A.M.P.A.S.



Super-Hilux®

THE PROJECTION LENS with GREATEST OVER-ALL INCREASE IN LIGHT TRANSMISSION

LIGHT F:1.0 COLLECTING SPEED

1 year in service . . . proven in hundreds of theaters!

1st to present an entirely new concept of theater projection!

1st to be designed with emphasis on acutance!

1st to be chosen by leading DRIVE-INS and THEATERS.

Four reasons why a Super-Hilux should be *1st* on your list of "Musts." Write for comparison tests and focal length computer to Dept. IP-116.

PROJECTION OPTICS

PROJECTION OPTICS CO., INC.
330 Lyell Ave., Rochester 6, N. Y.

TOUR OF PHOTOKINA

(*Continued from page* 17)

house at the top. Most Continental projectors are available in right- and left-hand versions.

In pre-war days the Ernemann projector was known throughout the world. In England we have a British-made version known as the Walturdaw; in Germany the name has been dropped in favor of Zeiss-Ikon, and on this stand was shown an ingenious use of television, for the purpose of reproducing the projected picture either in the manager's office, or in the theatre lounge.

As shown in the photograph, an inclined piece of glass in front of each lens deflects a proportion of the light downwards, to a lens and prism; between the two projectors is a collimating system, and the image from either projector is picked up by a compact television camera similar to those used in closed-circuit TV.

Several firms showed anamorphic optical systems of the conventional cylindrical type. More interesting in my view is the Delrama, which consists of a pair of cylindrically curved mirrors, arranged periscope fashion. In the 35-mm version it enables picture distortion due to a steep projection angle to be corrected; for 16-mm and 8-mm two types are available, giving respectively a 2-to-1 or a 1.5-to-1 expansion ratio.

In the 16-mm field, the finest display was that of Bell & Howell projectors—not, however, made in Chicago but in England; for the English Bell & Howell company is part of the J. Arthur Rank organization, and with only one exception, every piece of equipment in the display was of British manufacture. When Photokina was officially opened by the president of the German Republic, Dr. Heuss, a Bell & Howell projector was presented to him. RCA showed a 16-mm projector, similar to the American machine, but made on the Continent.

Small 16-mm Theatres

In Europe, and particularly in France and Belgium, there is a large number of small cinemas running on 16-mm film. Most popular of the projectors for this work is probably the Debrie, which with its heavy gearing and forced lubrication is capable of running for long periods without attention. (At the Debrie display the 16-mm projector was quite lost among the cameras, developing plant, printers, and other equipment).

However, 16-mm exhibitors have a hankering for a projector which is a miniature of a 35-mm machine. Two French firms, Hortson and Cineric, make projectors which look like Simplex machines scaled down. The former has an 8-picture intermittent sprocket, driven through reduction gearing from a Maltese-cross—not altogether a satisfactory system.

On British television, both BBC and commercial, the 35-mm film is preferred, although 16-mm is also used. But on the Continent 16-mm is used almost exclusively, preferably with magnetic sound. The Eclair Cameflex camera is the only camera in the world which, by simply changing the gate, can run either gauge of film, and it is widely used for TV filming.

It is possible only to mention briefly other features of the exhibition: the marvelous color transparencies, some of them yards in width; the excellent colored paper prints in Pakolar; at the Kodak booth a demonstration of the new inter-negative stock; a demonstration of the Som-Berthiot variable-focus lens by means of miniature TV cameras, so that onlookers saw themselves on the TV screens. I left Photokina with a full notebook, a bulging brief-case, and a feeling of mental saturation.

On the way home from Cologne, we stopped off at Eindhoven, in Holland, headquarters of the Philips empire. Here we heard a demonstration of a new system of stereophonic sound which was quite uncanny in its realism. This must be the subject of a further article.

"Oklahoma" On The Road

Rodgers and Hammerstein's "Oklahoma!", in Todd-AO, will open at the Capitol Theatre in Little Rock, Ark. adding another road show presentation of the famous musical.

Vallen for CURTAIN CONTROLS, TRACKS and SPECIAL OPERATING DEVICES

VALLEN, Inc.
AKRON 4, OHIO

SMPTE ON NEW PROCESSES

(*Continued from page* 10)

Scope releases will be in the 2.35 to 1 aspect ratio.

Barton Kreuzer, director of product planning for RCA, Camden, N. J., was elected to succeed Frayne as president of the SMPTE for a two-year term beginning January 1, 1957. Kreuzer is now executive vice-president of the Society.

Complete Slate Elected

Other officers elected were: Norwood Simmons, motion picture engineer with Eastman Kodak, who rises from editorial vice-president to executive vice-president; Glenn E. Matthews, technical editor, also with Kodak, becomes editorial vice-president of the Society; G. Carleton Hunt, president of General Film Laboratories, Hollywood, is convention vice-president, succeeding Byron Roudabush. Wilton Holm, of the Du Pont company, was reelected as secretary.

IA to Cooperate

Also during the West Coast meeting, the SMPTE took preliminary steps toward an education program beamed directly at projectionists for the purpose of assisting them in solving problems brought on by the introduction of new-process equipment at their theatres. Ralph H. Heacock, product manager of theatre equipment for RCA, has been named chairman of the new Projectionists' Information Committee of the SMPTE. Merle H. Chamberlin, chief projectionist at the M-G-M studios, was appointed vice-chairman of the group. Complete committee membership will be announced shortly. It will be composed of leading projectionists and other industry representatives. Chamberlin advised the Society that Richard Walsh, president of IATSE, has volunteered the support and cooperation of the union with this program.

The education program for projectionists is the second stage of an overall SMPTE training program which includes courses in film laboratory and sound recording techniques scheduled in cooperation with universities on both the East and West Coast. The West Coast program is already under way at the University of California in Los Angeles, and the East Coast program is expected to start soon, possibly with classes held at New York University.

Much emphasis was placed at this SMPTE convention on the reading of papers on various aspects of motion picture projection and sound. In addition there were demonstrations of



NO MIRACLES—NO FANTASTIC CLAIMS —NO MISLEADING PROMISES

AVAILABLE AT ALL THEATRE SUPPLY DEALERS

FISHER MANUFACTURING CO.
1185 Mt. Read Blvd.
Rochester 6, N. Y.

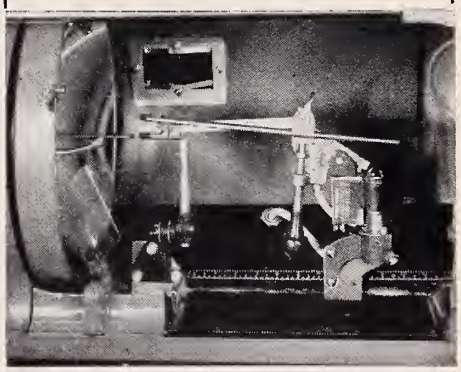
Are You Moving?

If so, please notify us one month in advance. The Post Office does not forward magazines. To avoid delay, please cooperate by sending us both your *new* and *old* address.

"Look! No Stubs! Just Easy Money!"



Absolutely the biggest bargain any theatreman can invest in today is a CRON-O-MATIC Fully Automatic Carbon Saver. It costs only $42.50 and will save you an average of $400 a year. It permits you to use up positive carbon stubs of any length, without preparation. When the stub is entirely consumed the new carbon goes into use without affecting the lamp operation in any way. Burning stubs of average lengths (3¼") down to ¾", saves you 22.2% on your carbon bill.



Designed for use with Ashcraft "D" or "E", Brenkert-Enarc, Peerless Magnarc, or Strong Mogul projection lamps. If your dealer can't supply you, order direct.

PAYNE PRODUCTS CO.
(Cron-O-Matic Division)
2454 W. Stadium Blvd., Ann Arbor, Mich.
( ) Send literature on the Cron-O-Matic
Ship Cron-O-Matic ( ) C.O.D. inc. postage.
( ) Remittance herewith.
NAME .....
THEATRE .....
STREET .....
CITY & STATE .....
Export: Frazer & Hansen, Ltd.
San Francisco, New York, Los Angeles

HUFF'S PACKAGE COOLING SYSTEM
Consisting of
(1) The Positive Carbon Cooler, (2) The Film Track Cooler, and (3) The Automatic Film Humidifier
will give you an advantage of from 10 to 25 per cent more screen light than is now available from your 16- or 18-inch mirror lamps used with Brenkert or X-L heads, plus a saving of 50 per cent lamp maintenance cost.
PROVE THE ABOVE IN YOUR OWN THEATRE.
See your dealer or write direct to
HAL I. HUFF MFG. CO. • 3774 SELBY AVENUE LOS ANGELES 34, CALIF.

the new MGM 65-mm projection system and 20th Century-Fox's CinemaScope 55 with 6-channel sound. Fifteen technical sessions, an equipment exhibit, committee meetings, and the presentation of Society awards occupied about 1500 delegates and visitors at the 5-day meeting.

Of additional interest, and never before featured at a SMPTE convention program, were papers on the principles and applications of transistors in motion picture sound and television equipment. There was also a demonstration of the Dumont Electronicam film system which combines motion picture and TV cameras into one unit.

Highlights of the TV sessions included the first technical papers on the Ampex Videotape Recorder, which makes a tape record of motion pictures, and also a tour and description of the NBC color TV studios in Burbank. A full-day trip to the U.S. Navy Electronics Laboratory at San Diego was also arranged for those interested in instrumentation and high-speed photography.

Presentation of awards for notable engineering work was another phase of the convention's activities. The Society's highest award, the Progress Medal, was presented to Dr. Alfred N. Goldsmith. Dr. Goldsmith, who was an important participant in the development of color TV and who also is responsible for many advances in the motion picture field, presently serves as a consultant to both RCA and Eastman Kodak Co.

Dr. Wesley T. Hanson, head of the color photography division of Eastman Kodak, received the Herbert T. Kalmus award for outstanding contributions in the development of color films. Donald G. Fink, of Philco Corp., received the Journal award of the Society for the most outstanding paper published in the Journal during the year 1955, "Color Television *vs.* Color Motion Pictures."

Following are brief descriptions of paper read during the Projection and Viewing session of the convention and which are of particular interest to projectionists:

A COLD-FOCUS GATE

VICTOR MERRILL
Tarc Electronics, Inc., Westbury, L. I.

At higher projection light levels, states the author, effects of heat-on-film appear, such as in-and-out-of-focus, brittleness, embossing and distortion in motion pictures. When still pictures are projected, melting and complete combustion of the film results. The Cahill-Merrill Cold Focus Gates removes all effects of heat-on-film, it is asserted. Every frame is in perfect focus and undamaged during the entire projection cycle, which may be 1/48th of a second or several hours.

AN ADJUSTABLE MOTION-PICTURE SCREEN FRAME

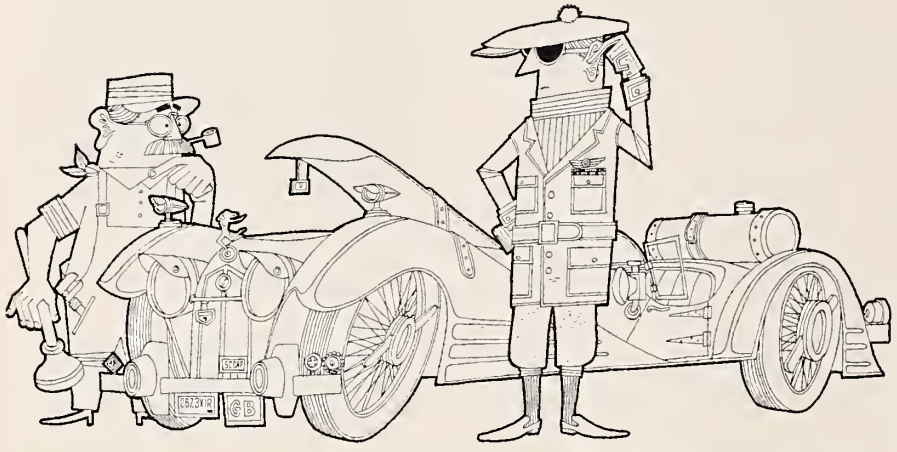
HAL GOLDSTEIN and DEAN GRIFFIN
G. & G. Specialties, Los Angeles

Greatly varying screen frames have been intalled throughout the world, the authors state. Some are big and flat while others are big and curved. In addition, there is a tendency toward deeply curved screens. The adjustable screen was designed to meet the need for varied projection systems without replacement of the frame.

HEAT-REFLECTING FILTERS: THEIR PROPERTIES AND USE IN CARBON-ARC PROJECTION SYSTEMS

RUDOLPH FISCHER and MARTIN PLOKE
Zeiss Ikon, Kiel, Germany

Modern projection techniques require special means for cooling the projection light in order to protect the film and to prevent buckling. Besides absorption



YOU WOULDN'T LET A PLUMBER TINKER WITH YOUR CAR!

Your car plays a vital part in the life of you and your family. You wouldn't dream of letting a plumber tinker with it.

So, too, your sound equipment is the most important property in your theatre.

It deserves the expert technical attention only ALTEC can give it. 6,000 satisfied ALTEC SERVICE customers have learned this.

HOW ABOUT YOU?

ALTEC® SERVICE COMPANY

SPECIALISTS IN MOTION PICTURE SOUND
161 Sixth Avenue • New York 13, New York
a Division of ALTEC COMPANIES, INC.

Clayton Ball-Bearing Even Tension Take-Ups
For all Projectors and Sound Equipments
ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS.
SILENT CHAIN DRIVE
THE CLAYTON REWINDER
FOR PERFECT REWINDING ON 2000-FOOT REELS.
CLAYTON PRODUCTS CO.
31-45 Tibbett Avenue New York 63, N. Y.

filters, there are also reflection-type filters available which can be inserted in the light beam without the need for cooling. The basic principle of such filters is an interference coating applied on glass plates similar to the method used in preparing cold-light mirrors. The paper gives details for the preparation of these filters. The filters are also used for color correction so as to color match the output from arcs having different color temperatures.

THE REVERSED ANAMORPHIC PROJECTION LENS

ROBERT E. GOTTSCHLAK
Panavision Corp., Los Angeles

A description of the principles in the operation of the reversed anamorphic projection lens is given together with specific applications.

EFFECT OF GATE AND SHUTTER CHARACTERISTICS ON SCREEN-IMAGE QUALITY

WILLY BORBERG
General Precision Lab., Pleasantville, N. Y.

Comparative measurements demonstrating the film behavior in curved and straight projector gates are given. The analysis takes account of operation under high light levels with two- and three-bladed shutters.

IMPROVED HIGH-INTENSITY ROTATING POSITIVE CARBONS FOR MOTION-PICTURE PROJECTION

R. B. DULL, J. G. KEMP, JR., and E. A. NEEL, JR.
National Carbon Co., Fostoria, Ohio

This paper describes improved 10-mm and 11-mm positive carbons developed for rotating positive carbon projection lamps. These carbons, designed for 95 to 110, and 110 to 129 amp. current loads, give substantial increases in light and efficiency, and operate more steadily and with greater stability than former carbons of the same size and type.

NEW DEVELOPMENTS IN SHORT ARC LAMPS

T. C. RETZER and G. W. GERLING
Westinghouse Elec. Corp., Bloomfield, N. J.

This paper covers the development progress on high-pressure short arc lamps from 800 to 2500 watts. Improvements in design features which have made these lamps practical for various applications are described. They cover electrical characteristics, arc brightness, spectral energy, distribution curves, and specific applications of different types of lamps.

THE HIGH-PRESSURE XENON LAMP FOR MOTION-PICTURE THEATRE PROJECTION

HEINZ ULFERS
Zeiss Ikon, Kiel, Germany

Lamps of this type from 1000 to 2000 watts now in use in medium-size theatres in Germany are described. They are considered sufficient for illuminating screens up to 30 feet wide for standard projection and up to 40 feet in width for anamorphic projection, according to the authors of the paper. It was stated that the white daylight color of Xenon, plus low maintenance and operating costs have increased the usage of this type of lamp for theatre projection.

PROJECTION TECHNIQUE

(*Continued from page 13*)

sive side sway was very noticeable.

(2) A loud thump in the sound which probably originated somewhere in the picture changeover devices. Condensers of about 11 mfd. capacity across contacts would probably correct this trouble.

(3) Focus drift was not bad, but someone in the crew must have been careless when changing from CinemaScope to wide-screen. Perhaps the lens preset collars were not accurately positioned.

(4) A Perspecta Sound integrator

SPLICES NOT HOLDING ?
Film breaks are costly. Play safe by using
JEFRONA
All-purpose CEMENT
Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.
CAMERA EQUIPMENT CO., INC.
DEPT. J
315 West 43rd Street New York 36, N. Y.
JUdson 6-1420

JACKSON'S Reel-End Alarms
Automatic, not Electric! Projectionists' Favorite! Patented — truly Dependable!
$21.50 per pair
on money back guarantee
Test one at your dealer or write to
American Theatre Supply Co., Inc.
2300 First Ave., Seattle 1, Wash.

A GREAT NEW SPOTLIGHT
designed by GENARCO INC. is now in production with these outstanding features:
- NEW PRINCIPLE CARBON ARC LAMP. THE RESULT OF YEARS OF RESEARCH FOR THE U.S. GOVERNMENT GIVES TWO TIMES MORE LIGHT THAN CONVENTIONAL ARC LAMPS, BECAUSE IT USES THE LIGHT OF BOTH CARBONS.
- COMPLETELY AUTOMATIC AND SELF-FOCUSING ARC LAMP.
- 2 HOURS OR 2½ HOURS OPERATION WITHOUT RECARBONING, FROM A CONVENIENT 115 VOLTS AC OUTLET.
- LARGE 16" DIAMETER REFLECTOR FOR HIGH LIGHT OUTPUT.
- 14,000 LUMENS TO FLOOD THE STAGE OR THE ARENA.
- LAMPHOUSE, REFLECTOR AND MECHANISM KEPT COOL AND CLEAN BY A BLOWER.
- ONE-LEVER SPOT SIZE CONTROL WITH MAXIMUM LIGHT OUTPUT FOR EVERY SPOT SIZE.
- USE OF MIRACLE MATERIALS: SILICONE BASE PRODUCTS, ULTRA INSULATORS, SPECIAL ALUMINUM ALLOYS, ETC. . . .
- AND TWELVE OTHER EXCLUSIVE FEATURES

FOR DESCRIPTIVE PAMPHLET ON THIS SUPER ACE SPOTLIGHT WRITE
GENARCO INC.
97-00 B SUTPHIN BLVD. JAMAICA 35, N. Y.
Manufacturers of the METROLITE, the world's most powerful spotlight

Lorraine ORLUX SUPER-CHARGED LARGE-CORED Carbons
For DRIVE-INS & THEATRES with HUGE, WIDE-AREA SCREENS • CARBONS, Inc. BOONTON, N.J.

was being used for the program, and it was mushing up the dialogue, especially on the stage-left channel. The reason for this trouble, some projectionists maintain, is in the nature of the beast, but I have heard the equipment perform better at this theatre. The serviceman should check this equipment at the first opportunity.

(5) From the auditorium I noticed that the exit light on the right-hand side of the proscenium was the source of a rather bright band of orange-red light at the center of the screen. A small shield in the right place could put an end to this.

Details Are Important

And so it goes. First-class projection demands close attention to a variety of details, many of them so minute as to easily escape the notice of those who have become over-familiar with a particular theatre through their daily work. All together, these tiny defects add up to displeased patrons, many of whom do not know why they are displeased.

Speaking as a minority of one, the writer would like to see the "visiting critic" type of test applied to theatres throughout the country. Coupled with an intelligent use of maintenance and repair records, this stratagem could go far toward making attendance at pictures a more pleasurable experience for today's choosy patrons.

HOLLYWOOD FILM MAKING

(*Continued from page 9*)

be expected to gross $600,000 or more in the domestic market. Nowadays, however, the same type film can only be expected to gross $450,000 to $500,000, and this only with good bookings. To reach the break-even point, producers feel that "B"-picture costs must be kept very low. Still another consideration is the growing difficulty of placing such second features in foreign markets.

Shorter Second Features

Warner Brothers is already under way in a shorter, cheaper, and better second feature program. The first in this series is completed; called "Trader Tom," the picture is billed as "documentary fiction" and runs only 42 minutes. The basic idea behind the Warner series is that 42 good minutes of motion pictures is worth more all around than 84 mediocre minutes.

Also, color is being given less of a play by the major studios than heretofore. It used to be that color was considered indispensable to CinemaScope and the other wide-screen processes. Not so today. In fact, both Fox and Metro are each coming out with important black-and-white pictures in CinemaScope. Color is regarded as a highly valuable tool, particularly where panoramic photography is involved, but it will no longer be applied arbitrarily to almost every big-budget picture—the nature of the picture will be considered.

On the subject of movie content, a number of extremely controversial films have appeared lately or are in the works to appear shortly. "Time Limit" deals with soldiers returning from Korea to face charges of Communist collaboration. "Storm Center" deals with a librarian's refusal to remove a Communist book. And the recent hit, "Bigger Than Life," is about the harmful effects of overuse of the drug cortisone. "The Man With the Golden Arm" is another such controversial picture.

These are all provocative films about things happening today. They are stimulating and they hit hard. The public is ready, willing, and eager for such movie fare.

Q: When is a mistake a blunder?

A: When a projectionist is not a regular subscriber to IP—MUST reading for the projectionist craft.

Use the handy order form below

INTERNATIONAL PROJECTIONIST
19 West 44 St., New York 36, N. Y.

Enter my subscription for ☐ 1 year (12) issues—$2.50
☐ 2 years (24) issues—$4.00

Foreign and Canada: Add 50c per year

Name .....

Address .....

City ..... *Zone* ..... *State* .....

STATEMENT REQUIRED BY THE ACT OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946 (Title 39, United States Code, Section 233) SHOWING THE OWNERSHIP, MANAGEMENT, AND CIRCULATION OF

INTERNATIONAL PROJECTIONIST, published monthly at New York, N. Y. for October 1, 1956.

1. The names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher: INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC., 19 West 44 Street, New York 36, N. Y.

Editor: JAMES MORRIS, 19 West 44 Street, New York 36, N. Y.

Managing Editor: R. A. ENTRACHT, 19 West 44 Street, New York 36, N. Y.

Business Manager: R. A. ENTRACHT, 19 West 44 Street, New York 36, N. Y.

2. The owner is:

INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC., 19 West 44 Street, New York 36, N. Y.

R. A. ENTRACHT, 19 West 44 Street, New York 36, N. Y.

3. The known bondholders mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities are: NONE.

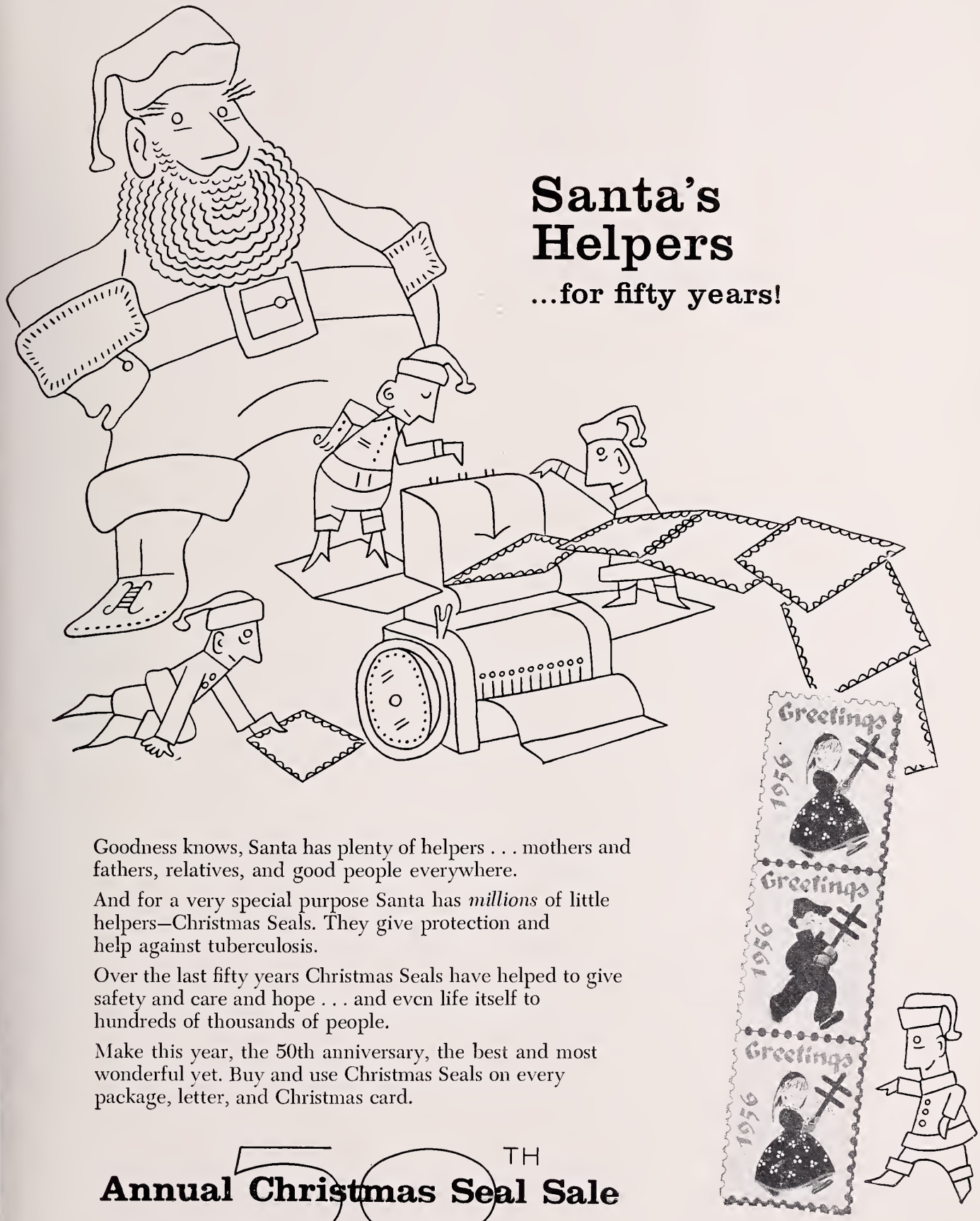
4. Paragraphs 2 and 3 include, in cases where the stockholder or security holder appears upon the books of the company, as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting; also the statements in the two paragraphs show the affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner.

Business Manager R. A. ENTRACHT

Sworn to and subscribed before me this 26th day of September, 1956.

(Seal) PAUL BOILEN

Commissioner of Deeds, City of New York
N. Y. Co. Clks. No. 48, N. Y. Reg. No. 8-B-21 Term Expires April 24, 1958



Santa's Helpers

...for fifty years!

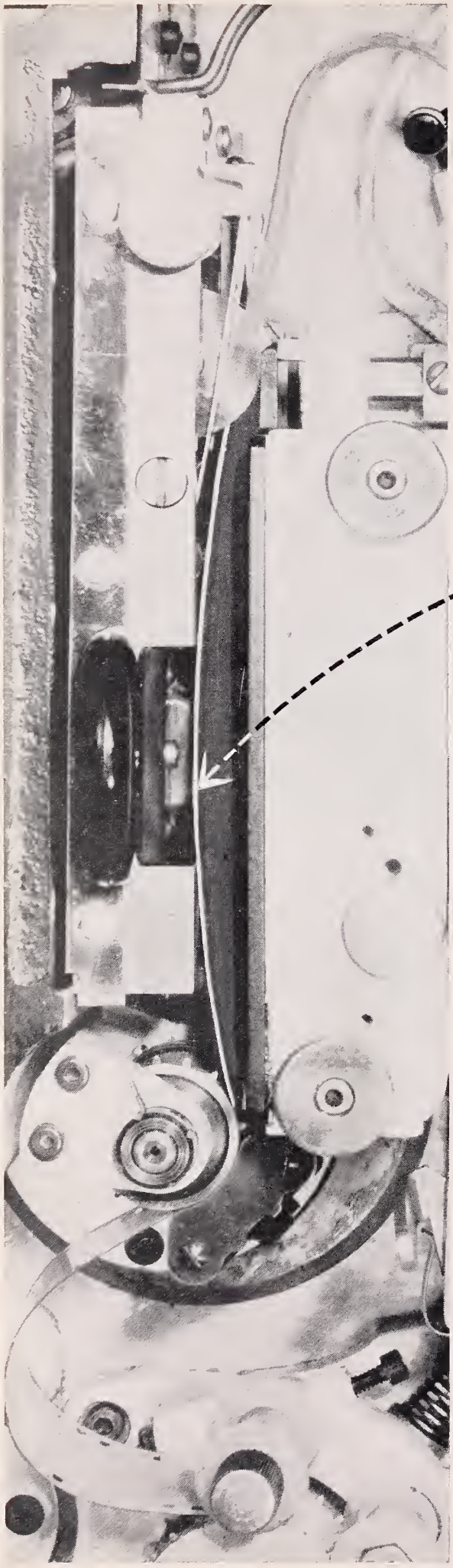
Goodness knows, Santa has plenty of helpers . . . mothers and fathers, relatives, and good people everywhere.

And for a very special purpose Santa has *millions* of little helpers—Christmas Seals. They give protection and help against tuberculosis.

Over the last fifty years Christmas Seals have helped to give safety and care and hope . . . and even life itself to hundreds of thousands of people.

Make this year, the 50th anniversary, the best and most wonderful yet. Buy and use Christmas Seals on every package, letter, and Christmas card.

50TH Annual Christmas Seal Sale



NOW...steadier, sharper projection for every theatre...with the NEW Simplex X•L

T. M. REG. U. S. PAT. OFF.

CURVED GATE

a must

for better projection of wide-screen films!

- Reduces film buckling caused by high temperatures
- Provides greater uniformity of focus... improves center-to-side focus
- Curved design steadies film and controls in-and-out movement of buckled film
- Proven effective in laboratory and field tests
- Available on new Simplex X•L projectors
- A simple adaptation to Simplex X•L's in service
- Uses existing aperture plates
- Easy to thread... no obstructions
- Easily removable for cleaning... no corners
- Adjustable spring tension assures intimate film contact
- Available with water cooling

Contact your nearest National Theatre Supply representative for more details

Better Projection Pays!

MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION

DISTRIBUTED BY NATIONAL THEATRE SUPPLY

SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

GPE

DEC 1955 B 627114

PROJECTIONIST

INTERNATIONAL



JAN 10 1957

DECEMBER 1956

VOLUME 31 • NUMBER 12

30c A COPY • $2.50 A YEAR

No lamp in the World!

CAN PRODUCE SO MUCH LIGHT.

Peerless HY-CANDESCENT TRADE MARK REG

CINEARC

NOT A REFLECTOR ARC!

WRITE FOR DATA

Peerless MAGNARC TRADE MARK REG

CINEARC

A 75-77 AMP. REFLECTOR ARC!

22,000 TOTAL LUMENS ON SCREEN

NO-HIGH-RATE *OF ($60.00) REFLECTOR BREAKAGE AND SILVERING DETERIORATION OR HEAT FILTER UPKEEP* !

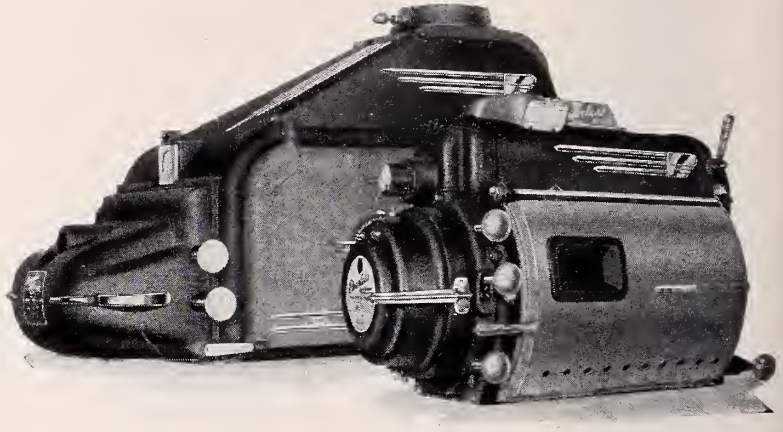
PROOF

Hy-Candescents were selected for all **important** "CINERAMA" installations. (Chicago, New York, Los Angeles, San Francisco, Philadelphia, and Washington, D. C.)

Hy-Candescents were chosen by Paramount for **all** installations of Horizontal "VISTA-VISION".

Hy-Candescents were again selected by TODD-AO for "OKLAHOMA".

You have to do the same if you want all the light there is for big pictures.



At 75-77 amperes . . . With presently available and standard 8 x 9 m/m copper coated carbons . . . With a .715" x .912" "CinemaScope" aperture . . . With a 3" Focus, F-1.8 coated projection lens . . . With a 14" diameter No. 2012 PEERLESS "Hy-Lumen" glass reflector that retails at a list price of $22.00 F.O.B. Chicago . . . With a No. 2880 PEERLESS Tail Flame Flue . . . On any kind or any size screen . . . No Heat Filter required.

All of this, at the **lowest** possible first, and operational **cost**. And

J.E.McAULEY MFG.CO.

552-554 WEST ADAMS STREET

CHICAGO 6, ILLINOIS

A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

DEC 26 1956

B 627114

B 627114

★

Season's Greetings



International Alliance of Theatrical Stage Employes and Moving Picture Machine Operators of the United States and Canada

Affiliated with the A.F.L. - C.I.O.

RICHARD F. WALSH
International
President

HARLAND HOLMDEN
General
Secretary-Treasurer

★

SPECIAL
pre-publication offer!

Send for your copy of the most complete and practical handbook for projectionists ever compiled!

Robert A. Mitchell's 500-Page MANUAL OF PRACTICAL PROJECTION

These chapter headings indicate the completeness of the book's contents:

PART I: FILM

- Inspection and Repair of Prints
- Prevention of Damage to Prints
- Film and the Heat Problem

PART II: THE PROJECTOR

- Notes on Projector Maintenance
- Film-Guiding in the Projector
- The Intermittent Movement
- Functions of the Projector Shutter

PART III: PROJECTION OPTICS; SCREENS

- Optical Efficiency in Projection
- The Projection Lens
- Lens-Matching; Care of Lenses
- Screen Types and Picture Brightness
- Screens, Apertures, Aspect Ratios

PART IV: THE ARC LAMP

- The Carbon Arc
- Operating Characteristics of Arc Lamps

PART V: GENERAL PROJECTION PRACTICE

- The Projectionist's Role as a Showman
- Projection Preparations for the Seasonal Theatre
- More Light for Drive-In Screens

PART VI: MOTORS, GENERATORS, AND RECTIFIERS

- Types of Motors
- Maintenance and Servicing of Motors
- Types of Generators
- Maintenance and Servicing of Generators
- Rectifiers for Projection Arcs

PART VII: SOUND REPRODUCTION SYSTEMS

- Photocells and Optical Sound
- Testing Amplifier Parts
- The Sound-on-Disk Reproducer
- The Sound-on-Film Reproducer
- Acoustics in Projection

PART VIII: PROJECTION OF COLOR AND 3-D FILMS; FORMULAS

- The Projection of Color Films
- Stereoscopic Projection
- Useful Projection Formulas

at a money saving pre-publication price of only **$4.50** *regular price $6.00*

● Hundreds of requests have been received for a permanent record of the Robert Mitchell articles that have appeared in INTERNATIONAL PROJECTIONIST. A handsomely bound compilation of the BEST of these articles is now on the press. By placing your order now . . . you'll save money and be one of the first to get a copy.

● This manual is divided in 8 sections and contains 30 chapters (see listing). A practicing projectionist as well as a recognized authority in this field, author Mitchell covers clearly and thoroughly every aspect of motion picture projection . . . from adjusting an arc lamp to the splicing of film.

● Profusely illustrated and crammed full of practical projection knowledge, Mitchell's MANUAL OF PRACTICAL PROJECTION differs from every other projection work in at least 3 ways:

1. **Its contents have received the enthusiastic approval of experienced projectionists.**
2. **<u>It does not</u> contain elementary principles of physics taken from school textbooks.**
3. **<u>It does not</u> contain manufacturers' pamphlets available to any projectionist for the asking.**

INTERNATIONAL PROJECTIONIST
19 West 44 St., N. Y. 36, N. Y.

Gentlemen: Please send me ..... copies of R. A. Mitchell's MANUAL OF PRACTICAL PROJECTION at the special pre-publication price of only $4.50 per copy, postage prepaid. Enclosed is check (or money order) for $.....

NAME.....

ADDRESS.....

CITY..... ZONE..... STATE.....

International PROJECTIONIST

R. A. ENTRACHT, *Publisher*
JAMES MORRIS, *Editor*
R. A. MITCHELL, *Contributing Editor*

Volume 31 DECEMBER 1956 Number 12

Index and Monthly Chat 5

Improved Effect Lighting in Theatres 7
ROBERT A. MITCHELL

Evaluating Efficiency of the Arc-Lamp Power Circuit 12
JOSEPH HOLT

Schools Utilize Closed-Circuit TV 14
BY PHILIP LEWIS

Dielectric Heat Splices Cronar, Acetate Film..... 16

Theatre Grosses, Production Increased for Year... 17

Faster Pulldown Geneva Movements 18
JOSE M. RUIZ

New Stereosound Idea 20
R. HOWARD CRICKS

National Carbon's New Labs 21

In the Spotlight 22

The Old Cranktwister 23

Projection Clinic 24

Letters to the Editor 26

New Products for the Industry 28

Science Notes 29

The Life of an Early Projectionist 30

Book Review 35

IA Obituaries 36

Miscellaneous Items, News Notes, Technical Hints

INTERNATIONAL PROJECTIONIST, published monthly by the International Projectionist Publishing Co., Inc., 19 West 44 Street, New York 36, R. A. Entracht, President. Telephone: MUrray Hill 2-2948. Subscription Representatives: AUSTRALIA—McGills, 183 Elizabeth St., Melbourne; NEW ZEALAND—Te Aro Book Depot, Ltd., 64 Courtnay Place, Wellington; ENGLAND and ELSEWHERE—Wm. Dawson & Sons, Ltd., Macklin St., London, W. C. 2. Subscription Rates: United States and U. S. Possessions, $2.50 per year (12 issues) and $4.00 for two years (24 issues). Canada and Foreign countries: $3.00 per year and $5.00 for two years. Changes of address should be submitted four weeks in advance of publication date to insure receipt of current issue. Entered as second-class matter February 8, 1932, at the Post Office at New York, N. Y., under the act of March 3, 1879. INTERNATIONAL PROJECTIONIST assumes no responsibility for personal opinions appearing in signed articles, or for unsolicited articles.

Entire contents copyrighted 1956 by INTERNATIONAL PROJECTIONIST PUBLISHING CO., INC.

420

Monthly Chat

Forward-Looking Exhibitors

SIGNIFICANT, considering the source, is the report made by the Equipment Standardization Committee of the Allied States Association at the group's recent convention in Dallas. The report stated that "there will be a big film," and that large drive-ins and large theatres should be very interested in this development. By this the committee meant that it believed the major Hollywood studios would, before very long, release projection prints similar to the 70-mm Todd-AO type and that this exhibitor committee supported the idea.

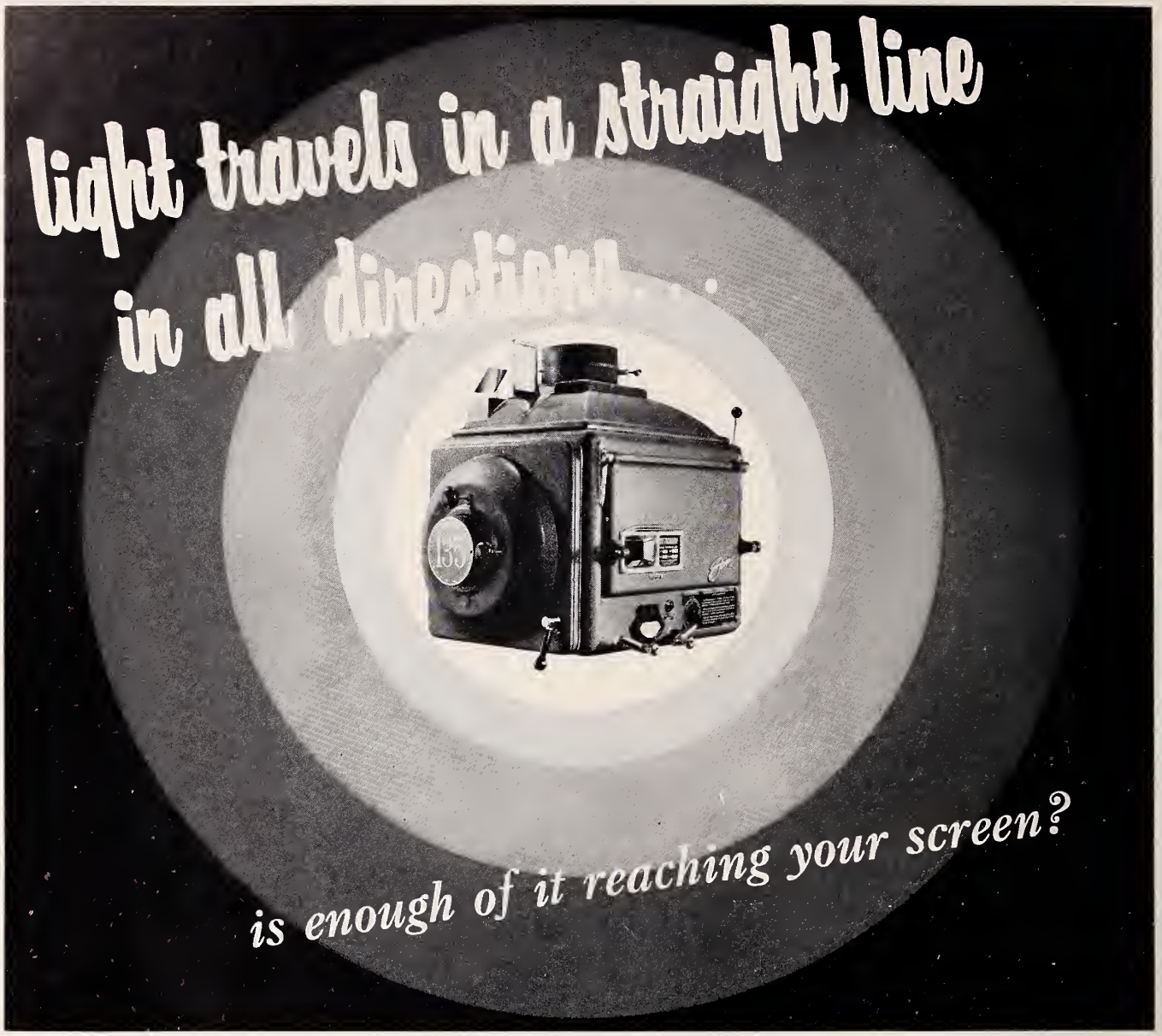
Almost constantly during the past few years, the industry has listened to anguished pleas from exhibitors that some form of absolute standard for motion picture prints must be restored so that all prints could be used in any projection room without changes in equipment. The Allied States Association certainly participated in this outcry. Furthermore, the members of this exhibitor group, since they represent independents and small chains rather than the big circuits, are those who have been hit hardest by TV competition and the shortage of feature films. Many are not in a financial position to buy new equipment. Yet this organization, under the leadership of Chairman Hugh McLachlan of its standardization committee, has reversed itself and supported the idea of further improvement in the projection process to obtain as fine a screen image as possible.

The committee's report stated, however, that it did not feel that a slowly increasing use of wide-gauge film would disrupt the industry. It was pointed out that the great majority of theatres would not need wide-gauge film to achieve a quality screen image, and that "modifications for certain late-model projectors" for handling a wide film width would be available when such prints are released. It was also noted that signs point to simultaneous release of both 35-mm and wide-gauge prints.

"This committee feels," the report stated, "that we must have progress and that the business must accept progress, so we must encourage in all ways possible anything that is an improvement, and the big film is definitely an improvement. There is nothing about it that should worry any exhibitor."

Cheerful Prediction

THIS IS the time of year when experts on the motion picture industry look back over the past twelve months, reckon up the profit and loss, and try to gaze into the future. The business is in a state of transition—no one seems to argue that point. Surveying the situation, various Wall Street financial experts on the industry have concurred that for the next three to five years both production and exhibition companies are going to improve in earnings. Main reasons for this prediction are the increase in quality pictures, population growth—especially in the 15- to 24-year age group, the industry's main customers—and some ground gaining in the ever-present battle with TV. It is agreed that the American public has become increasingly quality conscious and has shown its willingness to spend money on good pictures presented in well-equipped theatres.



IT WILL, IF YOU HAVE STRONG SUPER "135" PROJECTION ARC LAMPS

Exclusive lightronic system controls the burning of both carbons. Automatically maintains the correct arc gap length and holds the positive arc crater at the EXACT focal point of the reflector. A perfect light, evenly distributed, of constant intensity and unchanging color value is maintained WITHOUT MANUAL ADJUSTMENTS—exactly the same for both lamps. Changeovers cannot be noticed.

Burn a choice of four carbon trims, 9, 10, or 11 mm regular and 10 mm Hitex, to attain any desired degree of cost of operation, screen illumination, or burning time. Quick, simple changes attain the correct light requirements for any presentation technique—even two or more on the same program. A TRULY ALL-PURPOSE LAMP!

Single control amperage selection.

18″ f 1.7 or 16½″ f 1.9 reflector.

Infra Ban Beam Cooler. Diverts heat rays from aperture. Removable holder. Easy cleaning. Blower cooled.

Reflector and frame cooling device.

The arc is stabilized by its own magnetic field (no magnets are required and an air jet prevents deposit of soot on reflector).

Unitized component design.

Long-life positive carbon contact. Water-cooled carbon contact assembly (optional).

New conversion features engineered by Strong to fit into Super 135 projection arc lamps, to assure perfect screen lighting for the new 55, 65 and 70 mm wide film productions are now ready for your adoption. When you equip for any of these projection techniques, provision can be made for burning the 20-inch 13.6 mm carbons. A wider opening can be provided in the nose of the lamp, it can be fitted with a new dowser which fully covers the bigger opening, and a new high magnification mirror employed.

Impartial Foot-Candle-Meter Tests Will Prove that the Strong Super 135 Projects the Brightest Pictures Today

THE STRONG ELECTRIC CORPORATION

"The World's Largest Manufacturer of Projection Arc Lamps"

31 City Park Avenue — Toledo 1, Ohio

Please send free literature on Stong Projection Arc Lamps

NAME _____ THEATRE _____

STREET _____ CITY & STATE _____

INTERNATIONAL PROJECTIONIST

extends to all its friends

Season's Greetings

VOLUME XXXI DECEMBER 1956 NUMBER 12

Improved Effect Lighting in Theatres

By ROBERT A. MITCHELL

Described is a wide range of spectacular effects that can be obtained with projection-room spotlights and stage footlights by the use of additive and subtractive color lighting systems.

COLOR LIGHTING has always been a theatrical device of the utmost importance. In the average motion-picture theatre, color lighting of the stage and curtains before the show and during intermissions is an expedient of sure-fire potentialities. Saturated colors which spectacularly shift in hue provide a real visual treat.

Nearly every projectionist and theatre manager would like to have the facilities for good color effects—facilities which go beyond the old-fashioned spotlight "color wheel"—but only the largest theatres can afford the best commercial equipment for chromatic fireworks. It is nevertheless possible to "balance" the footlights and striplights for wide-range color lighting and to re-fit the spotlight or effect lantern (no matter how obsolete) for really pleasing results.

The theory of color vision has been discussed in a previous article.* We need only remind ourselves that the trichromatic theory of color conforms to the facts of human vision. Our eyes divide the *spectrum*—the rainbowlike band of visible wavelengths—into three broad color regions, namely, blueviolet, green, and red. There are other colors in the spectrum, to be sure; but they are "mixture colors" which may be duplicated by mixing these three *primary colors* in various proportions. Certain hues not found in the spectrum (the purples and magentas) cannot be made *except* by mixture.

How Eye Sees Color

The eye, like color negative film, is thus an "additive" color-recording device. It perceives the sensation of yellow, for example, by combining green and red primary-color stimuli.

Ordinary white light is an equivalent mixture of all three primaries (blueviolet, green, and red). Sunlight, or the balanced white light of the high-intensity arc, accordingly stimulates all three color receptors equally. This, too, is additive color formation. We do not encounter the reverse process of subtractive color formation until we begin using colored pigments, inks, dyes, and color filters.

Color filters are tremendously important colorwise because they provide one of the two ways by which colored light is produced. We may either use a colored source of light, such as a neon tube or a special fluorescent lamp, or take a white light-source (a bulb or an arc lamp) and place a color filter in the path of its rays. The filter method (the easiest even though the least efficient) is termed "subtractive" because it subtracts from the white light the colors we don't want, passing only the desired color or colors.

Subtractive color formation is extremely important in all color printing—color snapshots, magazine illustrations, and motion-picture films. The *reciprocal colors* known as lemon, magenta, and cyan are used because each subtracts its "complementary," a primary color, from white light. Lemon is complementary to blueviolet, magenta

* "Color and Its Reproduction on Film," by R. A. Mitchell, IP for December 1955, p. 7 *et seq.*

to green, and cyan to red.

A primary-color filter passes just one basic color component of the spectrum—a primary color, of course—but a reciprocal-colo filter passes two primaries in equivalent proportions. This fact reveals the chromatic composition of the reciprocal colors.

Lemon = Green + Red
Magenta = Blueviolet + Red
Cyan = Blueviolet + Green

This interesting fact can be demonstrated both additively and subtractively. Additively, green light and red light make lemon-yellow light. etc. Subtractively, two reciprocal filters are placed together: and the resulting color is a primary, *the primary common to each filter*. The remaining two primaries are absorbed, one by each reciprocal filter.

Lemon & Magenta = Red
Lemon & Cyan = Green
Magenta & Cyan = Blueviolet

While two reciprocal filters placed together give a pure primary as the resultant, two primary filters block off *all* light and look black.

There is an exact way of specifying colors and of showing what the resultant color is when any two colors are combined either additively or subtractively. "Color arithmetic" may be used to explain the embarrassing mistake of the fellow who though he could produce green light by burning yellow and blue bulbs in the footlights.

Specifying Exact Color

Colors are specified by writing the relative amounts of blueviolet, green, and red light needed to duplicate them additively. There are thus three numbers in a color specification: B-G-R. Magenta is 100-0-100, green is 0-100-0, white is 100-100-100, black (the complete absence of light) is 0-0-0, and medium gray is 25-25-25. (See Table A.)

Two of the most useful operations in color arithmetic are additive and subtractive combinations.

Additive resultant of two colors: Add the specifications of the two colors. (If any term of the sum *exceeds* 100, divide all three terms of the sum by 1/100 of the largest number.) This example shows that the gentleman who expected green light from yellow and blue bulbs got something quite different.

0	— 65 —	100	Medium yellow
+	+	+	
100	— 20 —	0	Medium blue
100	— 85 —	100	Pale lilac-pink

Subtractive resultant of two colors: Multiply the specifications of the two colors (and mentally divide the product by 100). This example reveals that the color produced by yellow and blue filters placed together is dark green—the color our friend mistakenly expected to obtain by the additive combination of yellow and blue lights (and actually got pale lilac-pink).

0	— 65 —	100	Medium yellow
×	×	×	
100	— 20 —	0	Medium blue
0	— 13 —	0	Deep green

Since green is one of the three primary colors, only green bulbs can be used for producing green light. PRIMARY COLORS *CANNOT* BE MADE BY THE ADDITIVE MIXTURE OF LIGHTS OF OTHER COLORS! Conversely, RECIPROCAL COLORS CANNOT BE MADE BY THE SUBTRACTIVE MIXING OF DYES OR PIGMENTS OF OTHER COLORS. A painter who has no lemon, magenta, or cyan paint is out of luck as far as these three colors are concerned.

TABLE A.

Hue	Trichromatic Specifications B - G - R	Wavelength Millimicrons	Complementary
BLUES:			
1. Blueviolet	100- 0- 0	440	LEMON
2. Blue	100- 15- 0	470	Lemon
3. Cerulea	100- 40- 0	480	Yellow
4. Turquoise	100- 70- 0	485	Mandarin
5. Cyan	100-100- 0	490	RED
GREENS:			
6. Aquamarine	60-100- 0	500	Cerise
7. Emerald	25-100- 0	510	Magenta
8. Green	0-100- 0	525	MAGENTA
9. Celadon	0-100- 25	550	Magenta
10. Chartreuse	0-100- 60	560	Amaranth
YELLOWS:			
11. Lemon	0-100-100	570	BLUEVIOLET
12. Yellow	0- 65-100	580	Cerulea
13. Safron	0- 50-100	585	Cerulea
ORANGES:			
14. Mandarin	0- 35-100	590	Turquoise
15. Orange	0- 20-100	600	Turquoise
REDS:			
16. Vermilion	0- 10-100	610	Cyan
17. Scarlet	0- 5-100	625	Cyan
18. Red	0- 0-100	>670	CYAN
19. Carmine	15- 0-100	(c505)	Aquamarine
PURPLES:			
20. Cerise	50- 0-100	(c510)	Emerald
21. Magenta	100- 0-100	(c525)	GREEN
22. Amaranth	100- 0- 45	(c560)	Chartreuse
23. Purple	100- 0- 25	(c565)	Chartreuse
24. Violet	100- 0- 10	<410	Lemon

Choosing Filter Materials

But even if we make our colored light by the subtractive action of color filters on white light, we may then either combine blueviolet, green, and red lights from separate sources (the additive method) or superpose lemon, magenta, and cyan filters over a single light-source (the subtractive method). Both methods are described here because each has certain advantages—the additive method for accuracy and great purity of color, the subtractive for tremendous illumination efficiency. Both should be used in the theatre, each for a particular purpose, namely, the additive method for footlights, striplights, etc. and the subtractive method for an all-color spotlight "colorplexer."

The choice of filter *materials* is as important as the colors (spectral characteristics) of the filters. Spotlight beams, for example are *hot*—hot



Loveliness is the mark of the star; to preserve this loveliness in every frame of every print is the task of the motion picture industry.

This calls for the industry's finest talents. It involves settings, dress designers, lighting experts, make-up artists, cameramen, film processors. Co-operation in all these areas is manifest in the Eastman Technical Service for Motion Picture Film . . . in Kodak's ability to supply a motion picture film for every purpose.

Motion Picture Film Department
EASTMAN KODAK COMPANY
Rochester 4, N. Y.

Divisions at strategic centers. Inquiries invited.

East Coast Division
342 Madison Ave., New York 17, N. Y.

Midwest Division
130 E. Randolph Drive, Chicago 1, Ill.

West Coast Division
6706 Santa Monica Blvd., Hollywood 38, Calif.

enough, in many cases, to crack glass, burn cellophane, etc. It is heartbreaking to find a perfect filter which cannot be used because the heat of the beam causes it to fade or deteriorate in other ways.

Sheets of dyed gelatine called "spotlight gelatine" are the most serviceable—and the least expensive—even though their spectral characteristics sometimes leave something to be desired. Spotlight gelatines are stained with fade-resistant dyes, and withstand heat very well. They become brittle only after long periods of use. All gelatine filters, however, must be protected from moisture. Finger marks cannot be removed.

To cut spotlight gelatines into pieces of the required shapes and sizes, place between two sheets of paper and cut with scissors.

Glass filters, while more stable so far as their spectral characteristics are concerned, are liable to crack when subjected to the heat of spotlight beams. Interference and dichroic filters are spectrally extremely accurate, but much too expensive for ordinary theatrical use. Sheets of dyed cellulose acetate wrinkle and blister. Colored cellophane scorches and burns.

For Theatrical Use

The spectral characteristics of color filters for theatrical use must be given careful consideration because filters do not give satisfactory results in either additive or subtractive color mixing unless they block off the proper regions of the spectrum. (Transmission of the "low red" region of the spectrum is unfortunately an unavoidable characteristic of most gelatine filters—even of green, cyan, and blueviolet filters, all of which should block *all* red light. A small amount of "red leakage" does no very great harm, however.)

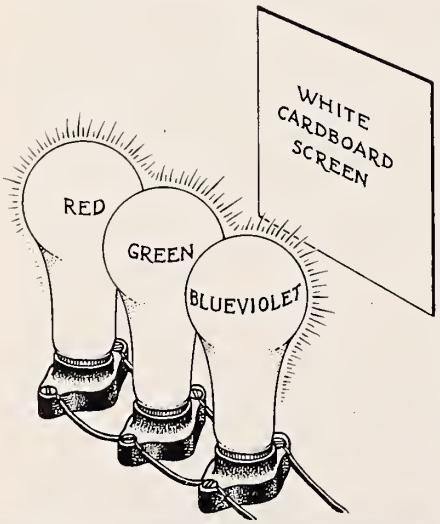


FIG. 1. "Balancing" primary-color bulbs for 3-circuit footlights or striplights. Three sockets are set up side by side, as shown, and bulbs of various wattages in each color are tried until a combination is found which produces white light on a cardboard screen a few feet away from the sockets. Blueviolet, green, and red bulbs of the wattages thus determined are then placed in the footlights.

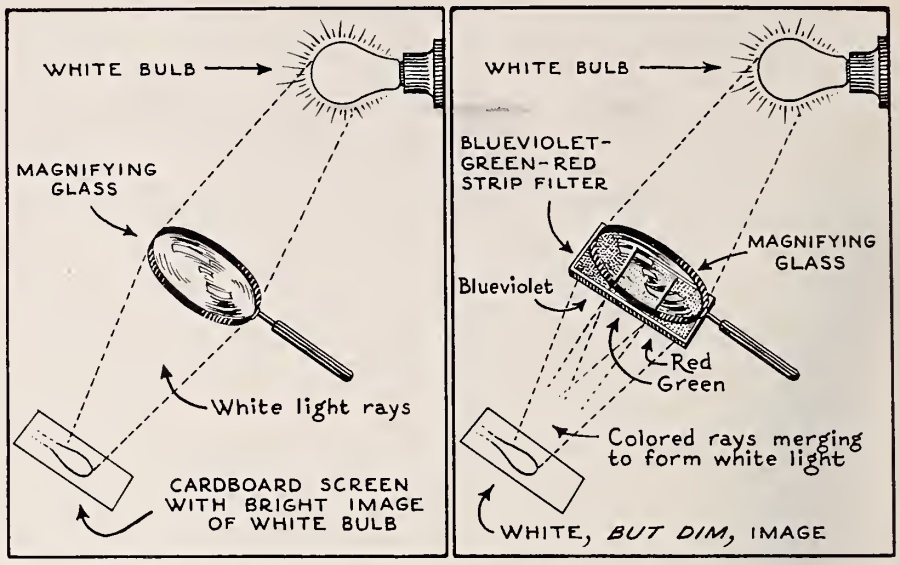


FIG. 2. How colors are produced additively by placing a primary 3-strip filter over a single large lens. Without such a filter, the magnifying glass shown on the left focuses a bright white image of the white lamp upon the cardboard screen—a matter of simple optics. If now, a chromatically balanced 3-strip filter is placed over the magnifying glass, as shown on the right, the image of the lamp will still be white, but somewhat dimmer because of light absorption by the blueviolet, green, and red strips. By covering any two of the three filter strips, the bulb image will be colored blueviolet, green, or red. If only one strip is covered, the image will be lemon (greenish yellow), magenta (purplish rose), or cyan (green-blue).

Now, while cheap tinted materials may be inefficient and give disappointing results (e.g. commercial blue, green, and red cellophane), it is also true that a filter may be *too good* for theatrical lighting purposes! We refer specifically to narrow-band filters which block off too much of the spectrum to have the necessary illumination efficiency in additive lighting or to permit the production of mixture colors by the subtractive process. Narrow-band, or monochromatic, reciprocal-color filters are useless for subtractive color formation.

Certain standards, accordingly, must be met by filters intended for theatrical color lighting. Primary filters should pass *just a little less* than one-third of the spectrum per filter. Transmission of the yellow should be avoided in the red filter transmission of red in the green filter, and transmission of red in the blueviolet filter. (A small amount of green transmission in the blueviolet filter is tolerated.) Spectroscopic examination of white light produced additively by a combination of theatrical primary filters should show only narrow absorption bands in the lemon-yellow and cyan-blue regions.

1. Primary-red spotlight gelatines should appear intensely red and cause green and blue objects viewed through them to look extremely dark—almost black.

2. Primary-green filters should be a pure, intense green in color, neither yellowish nor bluish. They should cause red objects viewed through them to look black (or an extremely dark red at most), orange objects to look gray (or at most a dark red-brown), and medium blue objects rather grayish. Excessive "red leakage" in a green filter will desaturate the blues and blue-greens produced by additive mixture.

3. Primary-blueviolet gelatines may give trouble. They should be a deep blue in color when viewed by moderately strong light, never violet. However, they may assume a violet tinge in dim light. They should cause red and yellow objects to look black, although a slight (and usually unavoidable) red leakage does no very great harm. Green objects should look either black or dark gray, but slight green leakage seems to be less harmful than slight red leakage. The reason why is that green leakage desaturates the mixture magentas and purples, while red

leakage desaturates the blues and cyans. The purples are less important, because less frequently required, than the blues, cyans, and aqua-greens.

Evaluation of reciprocal-color spotlight gelatines may be made visually. The lemon gelatine, for example, should be a bright, faintly greenish yellow, but by no means a pronounced chartreuse. Viewed through the lemon filter, blueviolet and (red-free) violet objects should look dark gray or black. Magenta gelatines should be a bright purplish rose in color, and reveal green objects as gray or black, yellowish green objects as dark brownish, and bluish green objects as dark grayish blue. Cyan gelatines should be a bright, very distinctly greenish blue—even greener than turquoise,—and show red and deep orange objects as black. (A small amount of red leakage in the cyan filter is common.) Use of blue gelatine for the cyan is to be avoided, else the greens and purples produced by subtractive mixture will be too dark.

Designing a System

With suitable filter materials at hand, the actual production of colored light for stage and screen color flooding may be considered. It will be noticed, as we go along, that all the scientific principles involved are very simple. The design, construction, and adjustment of additive and subtractive "colorplexers," however, call for ingenuity and patience.

"Light banks"—composite-source incandescent units including footlights and overhead striplights hung on battens—furnish the most common examples of additive lighting units. Most theatres outfitted for stage performances have a row of footlights comprising 3 or 4 separate circuits, if nothing else. Three circuits are for the primary colors, blueviolet, green, and red; and the fourth, where this exists, is for white (uncolored) bulbs. True, it is possible to produce white light with B, G, and R lights in proper combination; but the filters, by absorbing colors from the total light output, cut down the intensity of the light rather seriously and thus increase power consumption when larger bulbs are used to compensate for the light-loss.

Each separate circuit of the footlights and striplights should be controlled by a dimmer to permit fine shadings of hue and brightness. This is impossible when nothing but simple one-and-off switches are used. But even when 2-point switches are used, one position for full brilliance and the other for about 20% of full brilliance, a 3-circuit footlight setup permits a total of 26 colors.

The use of ordinary colored bulbs in footlights or striplights is not recommended. The spectral characteristics of commercial colored bulbs are unsatisfactory in the extreme. The better footlights make use of white bulbs in metal "pockets" or separator boxes, the open ends of which are faced with glass or gelatine color filters. If open colored bulbs *must* be used, white bulbs should be colored in the theatre. This is accomplished by dipping (not brushing) the bulbs in heat-resistant colored lacquer especially made for the purpose. Several coats of lacquer should be applied to each bulb for maximum purity of color.

Only the three primary colors, NEVER the reciprocals, are used for footlight and striplight bulbs!

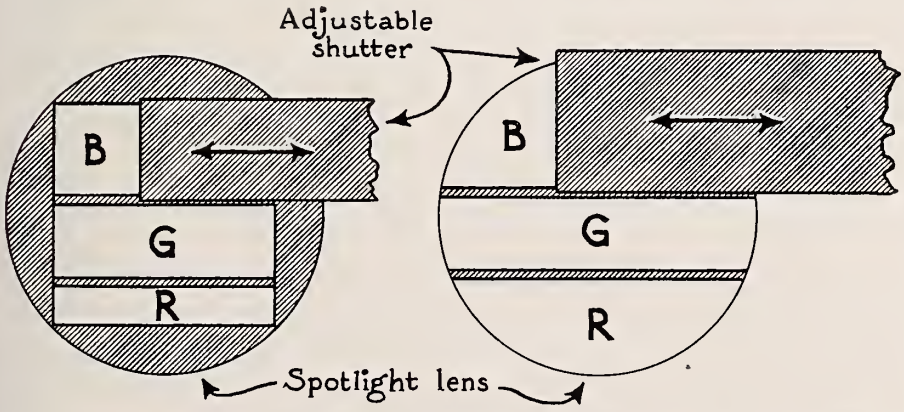


FIG. 3. Like the magnifying glass in Fig. 2, an effect-lantern objective lens (or the big bull's-eye lens of certain types of spotlight moy be covered by a primary 3-strip filter to produce colored light additively. The filter must be positioned in a secondary focal plone, of course, to avoid color bands in the projected light. Metal slides which can be moved in and out are employed os the means of vorying the amount of light passing through the filter strips, thus moking it possible to produce light of any desired color. The strip-filter ond slide device is colled an "odditive colorplexer." The undersize squore-shaped strip filter shown on the left permits extremely occurote colibrotion of the slide scales, and is used in colorimeters ond in color-film printers. The oversize strip filter on the right requires non-uniform calibration of the slide scales for color determinotion, but is better for spotlight use because it passes more light.

Balancing Footlights

The most important, and often the most difficult, job of all is *balancing* the three colors of light. This is done by choosing suitable bulb wattages for each color so that a pure white is produced on the screen when the blueviolet, green, and red circuits are "full on." The easiest way is to run a test with different sizes of bulbs lacquered with each color. Set up three test sockets close together, as in Fig. 1, and try out the different wattages of B, G, and R bulbs until a combination is found that produces pure white light on a nearby cardboard or paper screen.

It is found, in general, that the blueviolet requires a higher wattage than the green or red because the blueviolet gelatine filter or bulb lacquer is spectrally the least efficient. Suppose the test is carried out, and it is found that a 100-watt blueviolet bulb, a 60-watt green bulb, and a 40-watt red bulb produce white light when burning together. If each footlight circuit has an equal number of sockets, then 100-watt bulbs should be used in the blueviolet circuit, 60-watt bulbs in the green circuit, and 40-watt bulbs in the red. Very likely entirely different wattages will actually be required—only the test can determine *that* point!

If the best white light produced by the additive combination of B, G, and R lights appears decidedly tinted, merely omit a bulb at intervals in the required circuits, or "spot in" bulbs of higher wattage in the other circuits. For example:

Reddish white. If the additive white light looks salmon-pink, reduce the R wattage (or increase the B and G wattages).

Greenish white. Reduce the G wattage (or increase the B and R wattages).

Bluish white. Reduce the B wattage and, to a lesser extent, the G wattage (or increase the R wattage and, to a lesser extent, the G wattage).

It is best to aim for a whiteness not

(*Continued on page 32*)

When arc power is increased, it is important to determine if wiring can efficiently carry the load.

Evaluating Efficiency of the Arc-Lamp Power Circuit

By JOSEPH HOLT
Member, IA Local 428, Stockton, Calif.

THROUGHOUT the length and breadth of the land the visitor to projection rooms is struck by what is commonly accepted as a "horseback" appraisal of the quality of the screen image: the overall brilliance of the picture.

This means that steadiness, focus, contrast, definition and resolution are subordinated to the primary interest of screen illumination. Of all the problems which beset the working projectionist, the most common is the operation of a steady and efficient light source.

Most theatres have found it necessary to make equipment changes which will produce a greater quantity of light, or to go to larger carbon trims in existing equipment; yet in a substantial number of situations, no attempt has been made to determine the "day-long" efficiency of the arc power source. The intent of this article is to point out simple and accurate methods which will aid in judging the adequacy of existing power sources and wiring.

The most important step in making a system analysis is the tabulating of voltage drops encountered in the system during an entire cycle of daily operation. This is best done with meters which can be read to a volt or so, but the important point is the *difference* in voltage drops which may exist after the day's operation. In making a survey of arc power sources, we are interested in the relation of power consumed in the arc itself to the power which may be expended uselessly in cables, switchgear, and the like.

Kirchoff's Rule

One of the basic electrical laws is known as Kirchoff's rule in which it is stated that the sum of drops around a circuit must add up algebraically to the applied source voltage. The application of this principle is used in determining the overall efficiency of the arc power source and cables.

Measurement should be made of the voltage existing at the generator or rectifier terminals; of the drop across the series ballast or grid resistor, if any; and finally, the drop across the arc itself under normal steady-state operating conditions. The sum of the arc voltage and grid resistor drops will be very near to the applied or source voltage which was read at the generator or rectifier terminals. The difference will reflect the losses in the cable which connects the system components. Now it must be ascertained if the cable losses are reasonable, and what is of extreme importance, if the losses are stable during the entire daily operation.

If a study of the current handling ability of copper cable is made, and the resistivity of various dimensions is computed, the following results will be obtained: for arc amperages of the order of 70, #4 cable can be expected to produce a drop of 1.3 volts; for 95 amperes, #2 cable should indicate a drop of 1.1 volts; and the 125 ampere arc fed through #0 cable should show about 1 volt drop, while 145 amperes flowing through #00 will produce a voltage drop of less than 1 volt, or .85 volt. *(Author's Note: The calculated drops for various conductor sizes were computed on the assumption of an average length of 75 loop feet for each arc circuit. The reader must take into account any deviation from this norm.)*

If the sum of arc voltage and grid resistor voltage does not approach within a volt or so of the initial generator or rectifier voltage, the obvious conclusion is that the cable losses are excessive. Replacement of wasteful cable will certainly pay for itself in increased efficiency, and if the sizes given herein are used for the amperages designated, losses of only 72, 96, 125, and 123 watts, respectively, should be tolerated, or encountered.

Day-Long Efficiency

The determination of day-long efficiency is accomplished by repeating the measurement of the voltage drops at the end of the day's operation. Ready indication is thus obtained as to whether the cable losses increase as operation is prolonged.

Any change in cable losses will be traceable to undersized cable and the consequent temperature rise in the conductor. The resistance of metals increases with temperature, and as the copper heats its resistance rises which produces more loss in the form of heat, which in turn increases the temperature, and so on with serious losses resulting during later operating hours.

The relation of temperature change to resistance is expressed mathematically by the equation:

$$\frac{R_{t2}}{R_{t1}} = \frac{T_o + T_2}{T_o + T_1}$$

wherein the constant T_o for annealed copper is 234.5, and T_1 and T_2 are entered as beginning and ending temperatures Centigrade, respectively.

But the simple and direct method of measuring voltage drops at the beginning and end of operation obviates the need for mathematics; for if cable losses increase during the day, they will be indicated by increased voltage drops. The substitution of larger size conductors or the elimination of high-resistance splices and terminal points will result in highly efficient arc power sources, which will be steady and uniform from opening to closing hours.

Germans May Try Drive-Ins

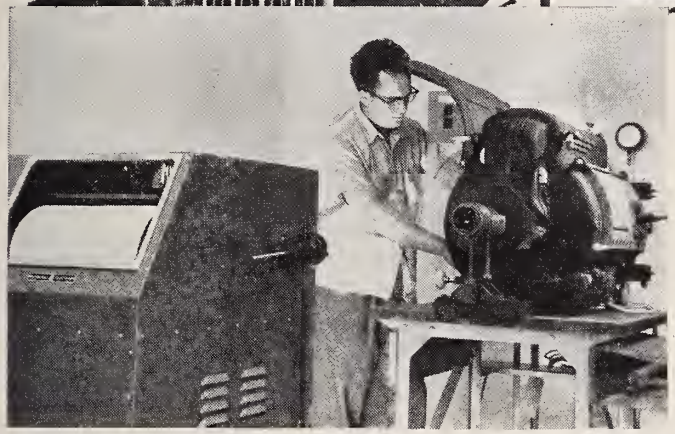
Drive-in theatres may be seen for the first time in West Germany either this year or next, if some stout-hearted exhibitors there have their way.

Following are the reasons why the country has resisted drive-ins thus far: a small ratio of automobiles, climatic conditions limiting operations to five months out of the year, a relatively low concessions sales potential, and a prohibitive law that keeps youngsters under 16 years of age out of theatres after 10 p.m.

At the outer boundaries of knowledge...

New Research Laboratories in Parma, Ohio. To expand its basic research in solid state and chemical physics, National Carbon Company has recently enlarged its staff of scientists and provided them with an ideal laboratory setup for creative work.





Studying color balance for better color movies. The spectroradiometer analyzes the complete "rainbow" of colors in projected light — to give an investigator, in one and a half minutes, information that he formerly worked half a day to get. Research like this helped National Carbon Company win the coveted "Oscar" this year for developing lighting carbons which were balanced to operate with other studio lights.

New "particle" theory promises help in developing still brighter carbon arcs

Although the high-intensity arc has been around for forty years now, nobody has yet been able to explain satisfactorily how it produces the super-bright light so useful for movie projection and studio lighting.

At one time it was thought that the brilliant light came from atomic reactions taking place within the glowing crater or pit at the tip of the positive electrode where the energy of the arc is highly concentrated. But this theory has been radically modified by researchers at National Carbon's laboratories.

Now it is believed that a much more complicated process takes place in the crater region where powerful electrical currents heat the carbon to temperatures of 10,000 to 12,000 degrees Fahrenheit, roughly the temperature of the sun's surface. According to the new "particle" theory, material from the molten floor of the crater vaporizes into tiny particles of the order of a millionth of an inch in diameter. These white-hot liquid droplets stream out into the space between the carbon electrodes of the arc to form a long, luminous tail flame or "comet tail."

Precise knowledge of this process, combined with results of other experiments now under way at the Parma laboratories, should point the way toward new, brighter lighting carbons that will stand up to higher and higher currents and temperatures. More details of the work at Parma are given in a new booklet titled "Research." Write for a copy.

Look to **NATIONAL CARBON** *for leadership in lighting carbons*

NATIONAL CARBON COMPANY • **A Division of Union Carbide and Carbon Corporation** UCC **30 East 42nd Street, New York 17, N.Y.**

Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco. *In Canada:* Union Carbide Canada Limited, Toronto

Schools Utilize Closed-Circuit TV

By PHILIP LEWIS

Excepting prize fights, many Theatre TV presentations were financial failures. However, the closed-circuit idea has been making gains in the field of education.

THE NEW Vidicon television camera is revolutionary because of its small size (roughly the dimensions of a shoe box), the fact that it may be self-contained as far as all necessary electrical circuits are concerned, and the added advantage of its low cost (industrial models are priced at $840). To assemble a closed-circuit chain it is only necessary to connect a TV camera to one end of a length of coaxial cable with the other end of this wire attached to the antenna terminals of a conventional television receiver. With this arrangement, the receiver will reproduce any image picked up by the camera. This simple setup is suitable for use in shops and laboratories to electronically magnify objects or to permit unobstructed viewing during demonstrations involving large groups of students.

To service overflow audiences, or two or more classrooms simultaneously, the inexpensive coaxial cable (5 to 8 cents per foot) is easily strung from room to room, and a single camera can produce duplicate images on receivers in as many rooms and locations as is desired. This approach involves another problem—the transmission of sound to accompany the visual imagery. A unit the size of the camera, known as the Audio-Mixer, provides the needed facility since it combines the signal from the microphone with the signal from the camera and transmits the combination over the same coaxial cable. The television receivers then reproduce both the picture and the sound.

Master Antenna System

In many educational institutions it will be found that TV receivers will not function satisfactorily unless they are connected to outdoor antennas, or that good reception will be obtained only in certain rooms at certain floor levels, but not in others. To insure optimum reception in all locations in a given building it is necessary that a master antenna system be installed. See Fig. 1. This involves the positioning of a separate antenna oriented toward each separate TV broadcasting location.

Each antenna lead is then fed into a special amplifier tuned for the particular channel involved, and in this way the signals are increased in intensity to the desired level. Then the outputs of the separate amplifiers are joined and mixed, and a coaxial cable system distributes the amplified signals to each of the many classrooms involved. Each classroom has a wall box containing a coupler unit to prevent interaction between sets, and a terminal plug that can be connected to a TV receiver in much the same way that a convenience outlet is used to power an electrical appliance in the home.

A system of this type need not necessarily be run in conduit since the maximum voltage carried does not exceed a volt, and the current is negligible. In contrast, telephone lines carry between 44 and 88 volts for ringing pur-

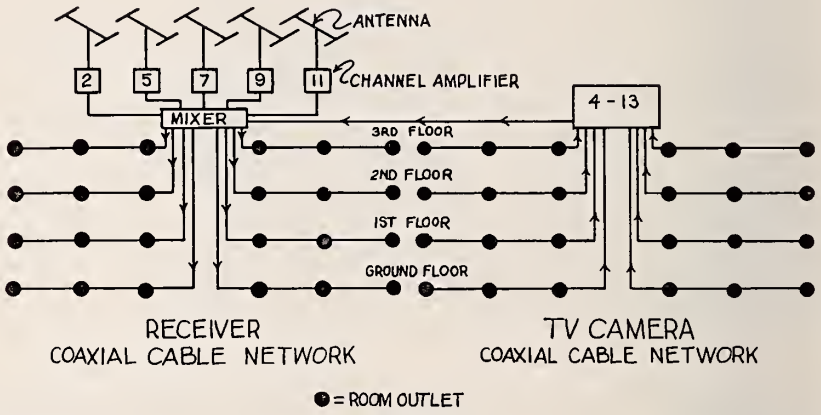


Fig. 1 shows how a master TV ontenna system can be combined with closed-circuit TV for use in schools. At upper left can be seen moster antennas, eoch oriented exactly with o particular TV broodcasting station and providing optimum reception in each room. Channels 4 ond 13 noted os upper right ore unused by broadcosters in this case, and clossroom TV receivers pick up closed-circuit progroms over these chonnels.

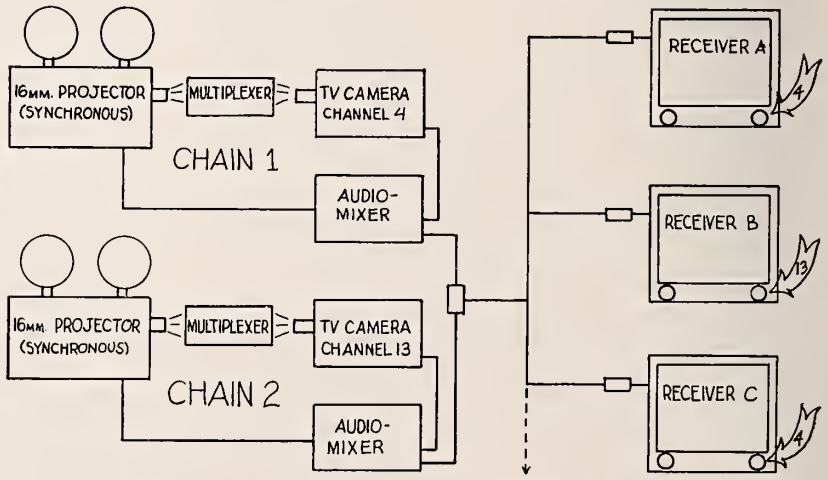


Fig. 2 shows how motion pictures can be transmitted to clossrooms by means of a closed-circuit TV system. The setup is a simplified version of film projection equipment used by small TV stotions. Instead of being broadcast, programs are tronsmitted direct to classroom receivers by coaxial cable.

† "Closed-Circuit TV," *Educational Screen*, Sept. 1956.

poses and are installed without conduit in homes as well as schools. This feature makes for economical installations and several systems have utilized the cold air return ducts of heating plants as convenient raceways to make the room connections.

Once the master antenna system is installed, the facilities may be expanded by the addition of a second coaxial system. These new lines also terminate in the wall boxes used for the TV receiver outlets, but would provide a second connection. The other end of the system feeds into another amplified setup and from there into the original mixer used by the antenna system. Now the dual cables make it possible to attach either a camera or a TV receiver or both in any of the locations —making any classroom a television studio or a viewing locale.

The potentialities inherent with such a system are almost limitless. Assembly programs can be shown to selected audiences in their own classrooms, activities of value in any classroom can be shared with one or more groups in separate locations, events can be witnessed by larger groups than would ordinarily be accommodated in a swimming pool, gymnasium or playing field, and overflow crowds at graduation time can be cared for in a study hall and other large rooms.

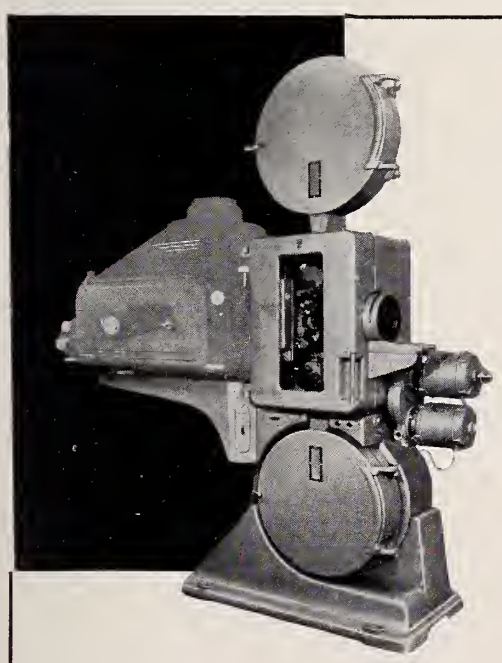
Centralized Projection

The practical problems involved in showing 16-mm motion pictures in individual classrooms are well known. With a coaxial cable distribution system such as the one described previously, it is possible to arrange for all projection to be done in a single room in a central location, but available for viewing in any room connected by the cable. See Fig. 2.

The TV camera is tuned to a particular channel that is not being used by either commercial or educational stations in a given area. A special, synchronized 16-mm projector is directed into one end of a Multiplexer (a lens-prism arrangement), and the TV camera is focussed on the other end of the device. In this way the images are picked up by the camera and sent out over the cable. The instructor in the classroom need only turn the channel switch on the TV receiver to the proper number to obtain the electronically reproduced movie. Of course, an Audio-Mixer unit is incorporated to provide the sound. If desired, remote controls can be provided to start, stop, or reverse the projector.

Since a single movie channel may not serve the needs of the larger schools, it is possible to add a second or a third chain with each tuned to a different channel. An added advantage is that the TV image is many times brighter than the ordinary image on the movie screen, and can, therefore, be viewed in subdued light rather than in a blacked-out situation.

There still remains the problem of transmitting color films in color. The equipment discussed to this point is for monochrome reproduction only. However, the same coaxial system can be used with color equipment when prices are reduced to lower levels, and color film can be viewed in black and white in the interim. At least one TV camera now on the market can be converted to color when desired.



Holiday Greetings

from

PHILIPS

To projectionists everywhere go our warmest greetings coupled with the hope for a continuance of the friendly relationship begun with the introduction of the Philips 35- and 70-mm all-purpose projector used in the Todd-AO production of Rodgers & Hammerstein's "Oklahoma!" and Michael Todd's "Around the World in Eighty Days."

PHILIPS — ***the finest in motion-picture projection equipment.***

Represented by:
NORTH AMERICAN PHILIPS CO., INC.
100 East 42nd Street
New York 17, N. Y.

PHILIPS

High-frequency current is used to weld film in system developed by Du Pont Co. to accommodate new film base.

Dielectric Heat Splices Cronar, Acetate Film

SINCE the tough polyester plastic used in Du Pont's new Cronar film base does not lend itself to the traditional splicing methods used for motion picture film, the company has been conducting an intensive program of experiment and development to devise new methods for quickly making strong joints in film printed on Cronar base. Use of Cronar by Hollywood for 35-mm release prints is expected in about a year's time.

Last year Du Pont demonstrated a method of splicing Cronar by the use

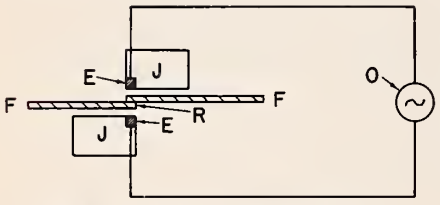


FIG. 1. Dielectric splicing method.

of overlapping patches of extremely thin Mylar tape coated with adhesive. This method was described in the March, 1955, issue of IP. While very useful in the projection room where a great volume of splices are not made daily, the Mylar-tape method is considered too slow for use at film exchanges and laboratories where splicing is a constant operation.

Dielectric Heating

To solve the problem of quickly making strong splices in either Cronar or acetate film, Du Pont has developed a new method of splicing film that depends on dielectric heating of the splice area and requires neither cements nor transparent adhesive tape. Splicers built along these lines are expected to be widely used by exchanges and laboratories and also in theatre projection rooms. A dielectric splicer utilizing the same principles as the experimental model described in this article has already been marketed by Neumade Products, New York City, and is described in the New Products section of this issue of IP.

High-frequency current between two electrodes fuses film together within approximately one second. Although heat sealing and splicing of plastic materials, including film, is already commercially employed in many fields, it has never been used in motion picture practice up to now. The resulting splice is said to be strong, permanent and as insensitive to moisture as the film itself.

The new splicing method was described at the recent Fall meeting of the Society of Motion Picture and Television engineers in a paper prepared by R. W. Upson, Emery Meschter and W. R. Holm, all of Du Pont's Photo Products Research Division. The paper was presented by Holm.

The essentials of the dielectric splicing method were also explained in diagrams accompanying the paper, several of these diagrams are reproduced here. Referring to Fig. 1, Holm described the new splicing method as follows:

"The films (F) to be joined are held between splicer jaws (J). Inserted in the end of each of these jaws is an electrode (E). These electrodes, together with the films to be spliced, form part of the circuit of a high-

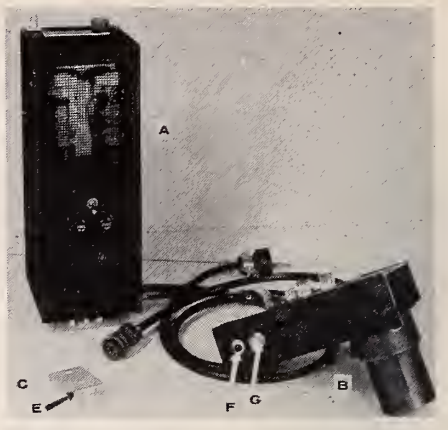


FIG. 3. Components used for altering a Bell & Howell Professional splicer to make splices by the dielectric method. These components are identified in article.

frequency oscillator (O). Energizing the circuit causes a high-frequency current to flow between the electrodes through the region (R), heating the films to the point of fusion in about one second. Warping and weakening of the films is avoided, since heating is concentrated at the joint itself. Dielectric weld splices reach their ultimate strength before the film can be removed from the jaws of the splicer, so no 'dwell' or holding time is required."

Circuitry of Splicer

Figure 2 is a schematic diagram of the circuit which powers the splicer. Of this circuit Holm states: "A type 826 triode tube is connected as a tuned grid-tuned cathode oscillator, with the series resonant load circuit tapped across the cathode as shown. Pushing a button on the oscillator box applies the B+ voltage to the tube plate. The tube begins to conduct, oscillating at a frequency of 230 megacycles. The series resonant circuit, of

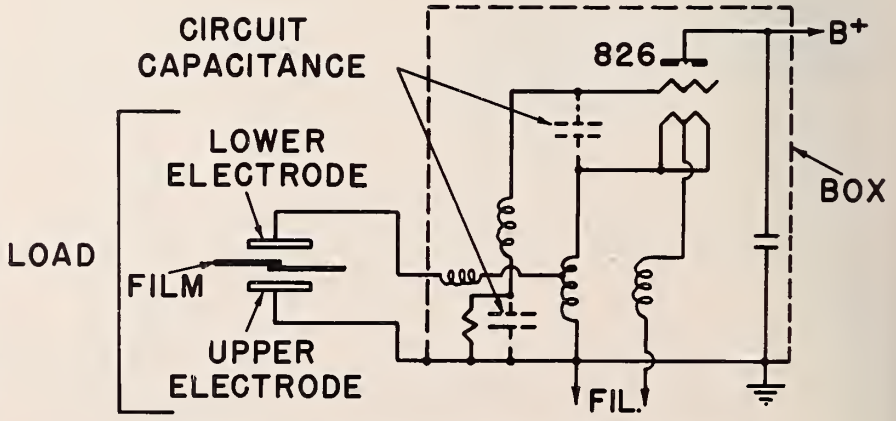


FIG. 2. Circuitry of power supply for dielectric splicer.

which the two electrodes and the films to be spliced constitute the capacitative reactance, appears as a low impedance shunt across the cathode circuit and a large radio-frequency current flows.

"It can be shown that splice formation begins just on the inductive (X_L) side of resonance. As the film heats

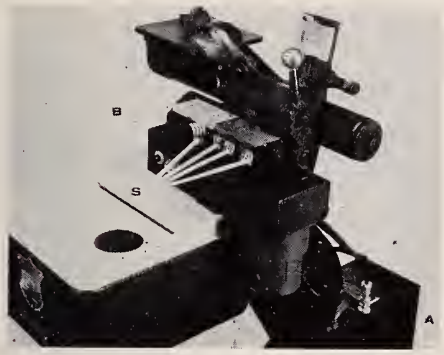
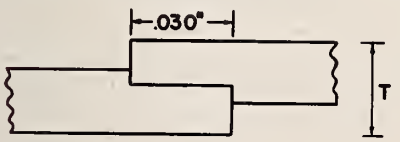


FIG. 4. Illustration shows components installed on the Bell & Howell splicer. Springs indicated by white lines pointing from S provide positive short-path grounding of upper jaws of the splicer when jaws are closed.

up and melts the spacing between the electrodes decreases, thereby increasing the capacitance of the condenser formed by the two electrodes and the films dielectric. The circuit thus passes through resonance and over to the capacitative (X_C) side. This detunes it sufficiently to present a relatively high impedance and so essentially shuts off the current flow in the splice.

"This feature makes it impossible to overheat or burn the film. It is also used to signal the operator when the splice is completed. As the current flows, it lights a small neon lamp coupled to the circuit inductively; when it stops the light goes out."

The component parts used by Du



THICKNESS "T":
5.6 TO 8 MILS FOR .004" "CRONAR"
6.9 TO 11 MILS FOR .0055" CTA

FIG. 5. Illustrated is the narrow overlap of dielectric splice.

Pont in altering a Bell & Howell Professional splicer for the dielectric method is illustrated in Fig. 3. The power supply is shown at A, the oscillator box at B, and a special lower left-hand splicer plate at C. The button which starts the splicing action is shown at F, and the neon lamp which signals the completion of the splice may be seen at G.

Narrow Overlap

Figure 4 shows the components installed on the splicer. The power supply is positioned at A, at the rear of the pedestal. The oscillator box is positioned at B. The springs indicated by S provide positive short-path grounding of the upper jaws when they are closed. This arrangement is needed for the proper operation of the oscillator.

The narrow overlap of the dielectric splice is diagrammed in Fig. 5. It compares with 72 mils for the standard solvent splice made with cement. The peel strength of this narrow splice is said to be greater than a 72-mil splice made with cement.

"The splices which we have described have been Cronar to Cronar and triacetate to triacetate," Holm stated. "Both of these types can be made on the same equipment without intermediate adjustments. A satisfactory set of conditions for making mixed splices between Cronar and triacetate films at the quality level attainable for homogeneous splices has not yet been demonstrated, but we are actively pursuing this goal."

Theatre Grosses, Production Increased for Year

For the most part, theatre grosses are now on the climb. Although patrons are fewer in number, the trend seems to be that ticket-buyers are paying more money to see fewer pictures. However, the theatre owner is faced with the same problem that is troubling many other businesses: the need to reduce costs and maintain gross levels. The increased revenue indicates the existence of a present and potential large audience.

According to Wall Street appraisers, better film products are now luring the public away from its TV set—helped, of course, by the fact that this has been a dull year for TV. The early apprehension that re-release of some of the better old films would hurt the present market seems to have been dissipated.

Future Promising

Taken separately, most studios show a definite gain in gross for their past fiscal years. Although net profits are off, gross business is well up, and it is considered that the new economies being introduced in the industry will contribute to turning the gross into net profit.

American Broadcasting-United Paramount will realize over $200,000,000 total revenue this year, highest in its history. Columbia records a $91,000,000 total gross, not counting the take from "Eddy Duchin Story" and "Picnic," two of its biggest money-makers. 20th-Fox announces a 4% increase in both gross and operating net profit. Universal's gross for the fiscal year is a record $80,000,000, and net profit is also up. An increase of $2,500,000 over last year marks Paramount's $115,000,000 take for this year. Paramount will, of course, be relying on "Ten Commandments," but the payoff on that production will take about three years.

Of the major corporations, two, Loew's and Warner's, will show some decrease in gross due to a static situation brought about by top personnel changes.

Along with the increased grosses, major studios are planning to release more pictures next year, a factor of some importance especially to the small theatre owner. Increased distribution is a policy tailored to fit the small operator. Add to this the gradual weeding out of fringe theatres and those uneconomically suited to the present situation, and the outlook for the small theatre owner is better than it has been in some time. According to surveys made among small theatre managers, quality and frequent changes of bill, especially in the "bread-and-butter" pictures, are two major keys to profits.

Improved Screen Surface

The Williams Screen Co., of Akron, announces that it has completed research on a new type of screen finish which is claimed to embody the qualities of both white and silver screens. Special application of a pearly white pigment is said to produce a finish with a high light gain similar to a silvered surface but with adequate diffusion for wide theatres.

The new screen is of vinyl plastic construction with electronically welded invisible seams. The surface is infra-red baked and is resistant to stains and scuffing. Since it is water-proof, it can be cleaned by washing.

Canadian Fires Decline

There were 25 theatre fires in Canada last year, according to the Fire Prevention Branch of the Department of Public Works, with a $201,302 damage total. These figures are below the average year total, which is 37 fires and damage of $218,600. There was no loss of life nor injuries reported. For the past 20 years there has been no loss of life in Canadian theatre fires, an impressive safety record.

Faster Pulldown Geneva Movements

By JOSE M. RUIZ

The author explains some previous methods of increasing screen brightness through speeding up the geneva intermittent action and recommends an accelerated geneva movement for future use.

INADEQUATE screen illumination is probably one of the oldest problems in motion picture projection. There is also the related problem of flicker which increases as light levels are raised through the use of a more powerful light source. Experts have long pointed out that projector manufacturers have not given serious attention to the matter of reducing intermittent pulldown time as the only direct solution to both these problems.

In a recent article in IP*, Robert A. Mitchell disclosed some interesting information about the poor illumination levels at modern drive-in theatres as well as in conventional indoor theatres with large screens. As a partial solution, he advocated the use of fast-pulldown intermittent movements of 5-to-1 ratio instead of the conventional 3-to-1 ratio between pulldown and dwell time.

Up to the present, the vital problem of screen brightness has been attacked almost entirely from the point of view of illumination sources and optics—high-intensity arc lamps, faster lenses, high-speed mirrors and shutter-transmission efficiency. In spite of improvements in all these areas, the problem still exists. There is an urgent demand at present for more light and a flicker-less picture for large screens.

The question of shutter efficiency in particular has been studied extensively in the past, but none of the many suggestions offered to increase transmission permitted an efficiency greater than 48% with shutters having a 93-degree angle of coverage for each blade. It is a fact that shutter blades cannot be further reduced in size without introducing flicker unless the intermittent pulldown time is decreased.

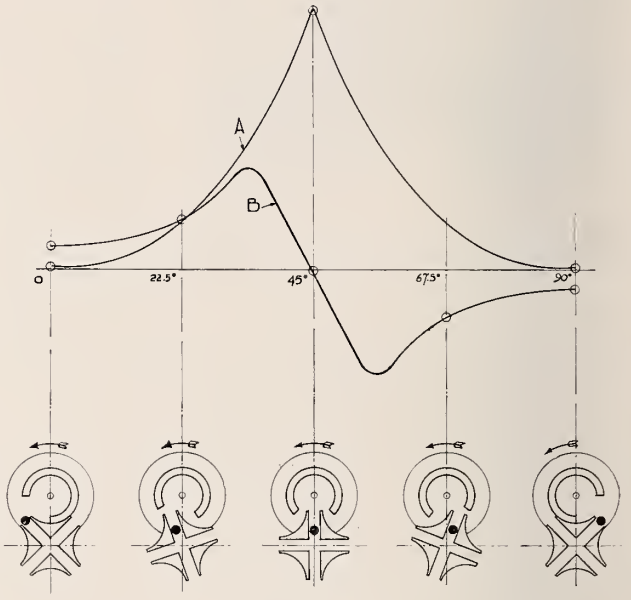


FIG. 2. Five stages of star-wheel and cam-pin engagement in standard Geneva movement.

Design Factors

There are a number of factors which the designer of motion picture projectors must take into account when designing intermittent movements. One of the basic factors to bear in mind is the visual function known as persistence of vision. Without this facility of the eye, the illusion of moving pictures would never have been possible.

Human vision depends on complex and delicate characteristics of the optics of the eye, the nerves of the retina and the brain itself, but it can be compared for practical purposes with the light-storage characteristic of the electronic TV camera tube. Our vision provides us with the ability to store any degree of light intensity for a short period in the retina of the eye. Any light falling on the retina persists for a short time after the light is extinguished. The length of this persistence varies but is near 1/40th of a second for normal vision.

The relationship between the light-storage ability of the retina and increased screen brightness through a shorter pulldown period is easy to understand. If pulldown time is reduced from 3-to-1 to about 5-to-1 ratio, more light will be delivered to the screen and stored by the retina even though the lumen output of the light source is not increased.

With such a fast intermittent, both

* "More Light for Drive-In Screens," by R. A. Mitchell, IP for April, 1956.

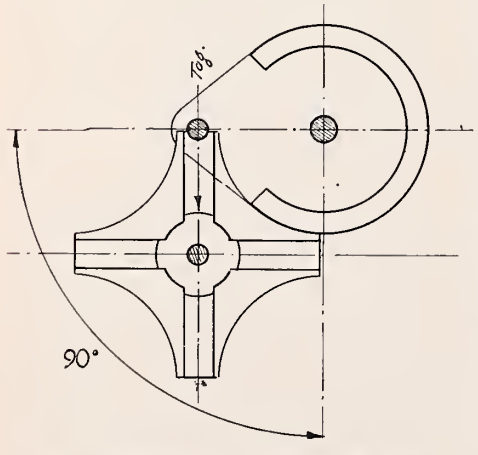


FIG. 1. Standard 3-to-1 geneva movement.

About This Article

The reader's first reaction to this article may be that it is an academic treatise containing complicated information far removed from the day-to-day problems of getting a bright, sharp image on the screen. This would be far from the truth. The problem of adequately lighting large screens without destroying the film in the process has become so serious that one or more American projector manufacturers may shortly offer a replacement intermittent movement with a faster pulldown action.

Although no information is as yet forthcoming on the design of these faster movements, it is thought that they will follow one of the basic design principles described by Mr. Ruiz. This is the design that involves an offset drive shaft and a "slipper block" to accelerate the speed of the geneva cam during the portion of its cycle that it is engaged with the star wheel.

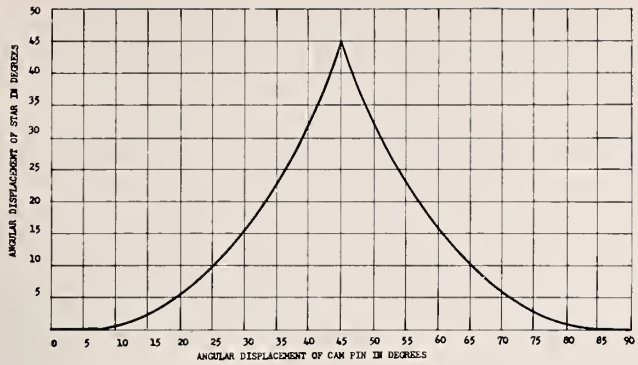


FIG. 3. Angular displacement of star wheel in relation to cam-pin rotation.

blades of the shutter could be reduced from over 90 degrees to a little more than 60 degrees, and overall transmission efficiency would be increased from less than 50% to over 65%. However, the flicker frequency remains at 48 cutoffs per second, and a more disturbing flicker may be created than with a conventional 93-degree shutter if the illumination reaches high levels and the theatre has a short projection throw to a large screen. The reason for this is partly brought out in research done by F. C. Mathieu in France with respect to flicker and eye fatigue. Eye fatigue tends to occur when the screen image covers the whole retinal field since the secondary or side-vision area of the retinal field is more sensitive to flicker. When we consider further that flicker always becomes more noticeable as the light level rises, it becomes evident that a situation where the side areas of the retina receive a very bright image could cause irritation.

Three-Bladed Shutter

Therefore, the 5-to-1 intermittent would probably give best results when combined with a flickerless 3-bladed shutter providing 72 60-degree cutoffs per second. An exception would be large drive-in theatres. The 2-bladed 60-degree shutter would be adequate there because the light level would not be high enough to introduce disturbing flicker.

Two excellent articles dealing with intermittent movements have appeared in past issues of IP*. However, for comparative purposes it is essential to describe the geneva movement again, especially with regard to motion study and geometrical design. Fig. 1 shows the familiar geneva star wheel and cam pin, the 3-to-1 movement of 90 degrees cam action which is universally employed in present-day 35-mm projectors.

Fig. 2 illustrates the five stages of cam-pin engagement with the curves plotted graphically to show what happens during the pulldown cycle. Two curves are plotted as follows: *A* represents the star wheel angular displacement against the cam-pin angular rotation, and *B* the rate of film acceleration from zero to 90 degrees. The curve *A* shows the gentle action of the driving pin as the pulldown cycle starts. From the beginning of the acceleration phase of the pulldown stroke to the middle of the cycle or 45 degrees cam displacement, the star is moving with accelerated motion until it reaches its maximum velocity. Past the middle of pulldown stroke, the star is moving with decelerated velocity until it reaches 90 degrees or rest position. This rapid action is achieved in 1/96th of a second if the machine is running 24 frames per second.

The curve in Fig. 3 shows this action plotted in terms of angular displacement. We can see at a glance the displacement of the star wheel against the cam-pin displacement in terms of degrees for any relative position of the two components in motion. The curve plotted in Fig. 4 illustrates the velocity ratio between the star wheel and cam pin in terms of cam-pin rotation in RPM (revolutions per minute) for the two mechanical elements. The cam-pin shaft rotates at the uniform or constant rate of 1,440 RPM for 24 frames per second at sound speed. When the cam pin reaches the 25 degrees of angular displacement, the star wheel is moving at the same speed as the continuous velocity of the cam-pin shaft, or 1,440 RPM.

It can also be seen that at the beginning of pulldown, 10 degrees of cam rotation, the star wheel is moving at 300 RPM speed, while at the middle of pulldown the star wheel reaches its greatest velocity, or 3,456 RPM. The curves have been plotted mathematically by trigonometry** and are the main basis for analyzing any type of geneva motion.

These facts are essential to a clear understanding of the reasons why the geneva star and cam pin give the film such desirable acceleration transport action in overcoming the inertia of film, and the frictional forces created by the gate pads. In these simple principles lie the advantages of the geneva movement.

Possible Solution

When the designer faces the question of speeding the pulldown action of the *standard* geneva star, the matter becomes insoluble due to the fixed conditions imposed by the geometry and mechanical properties of the four-slot geneva star wheel. However, there are two possible variations in design that can solve the problem. The first is to increase the locking-ring diameter. This solution was very popular in old Pathe projectors. In fact, the Pathe 60-degree geneva intermittent designed by Cotinsouza (the manufacturer of Pathe projectors) was known as "Systeme Cotinsouza." This system, due to

(*Continued on page 27*)

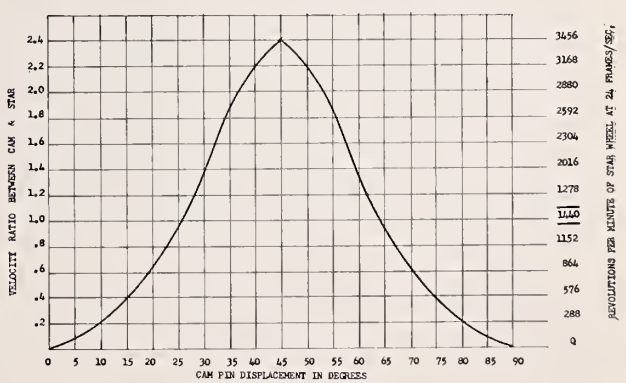


FIG. 4. Velocity ratio between star wheel and cam pin in terms of revolutions per minute during pulldown cycle.

* "Heart of the Projector Mechanism," by R. A. Mitchell, IP for July, Aug., and Sept., 1952; "The Geneva Intermittent Movement," by A. C. Schroeder, IP for July, Aug., and Sept., 1952.

** "Application of Pure Mathematics to the Solution of Geneva Ratios," by Ron. H. Jones, *Journal of the SMPE*, July, 1946.

Binaural reproduction plus a delay in sound to surround speakers is claimed by Philips to create unusual realism.

New Stereosound Idea

By R. HOWARD CRICKS
Kinematograph Consultant, London

IN MY REPORT last month in IP on Photokina, I mentioned that on my way back to London from Cologne, I stopped off at the Philips factory at Eindhoven, Holland. George Bakos took me around the electro-acoustic department (known for short as ELA) and showed me quite a range of new equipment, including a very attracttive tape recorder.

He also demonstrated ingenious equipment for introducing a delay into loudspeaker feeds. The heart of this equipment is a drum, coated on its periphery with magnetic emulsion; it turns slowly, and has around it a recorder head, a number of reproducer heads, and an erase head. The idea is that a sound can be recorded upon the drum, and as the drum turns it will be picked up by any one of the reproducer heads, and be reproduced with a fixed time delay. As the drum rotates, the sound passes under the erase head and is wiped off, ready for the next bit of recording.

I was a little puzzled—as I expect the reader is—as to the purpose of this equipment. In England the British Thomson-Houston Co. has demonstrated a different type of sound delay system, consisting simply of a length of pipe coiled inside a box; it is intended for use with a stage repeater system in a live theatre, so that in any part of the theatre, sound from the stage speakers and from the auditorium speakers will reach a patron's ears at the same instant and ensure clear speech.

Two-Microphone System

But this idea of Philips' was intended for something different. In the ELA department is a delightful little auditorium, which is used for all sorts of purposes, including testing and comparing loudspeakers. Here George Bakos introduced me to Dr. D. Kleis, who explained the application of this delay system to the stereophonic reproduction of sound.

First of all, the system of recording is quite different from that used for CinemaScope films. Instead of three microphones spaced across the set, two microphones only are used, mounted on an "artificial head"—actually just a ball the size of the human head, with the microphones situated in place of the ears. It was explained that this artificial head produced in the two microphones exactly the same effects as in our ears; sounds approaching from the front are heard with equal amplitude and in the same phase in both ears, while in the case of sound from either side, the waves received by the ears will differ in both amplitude and phase. There will also be the effects of reflection and refraction around the head. This two-microphone type of recording is usually referred to as "binaural" rather than stereophonic.

The output from the two microphones was recorded upon tape, but it could equally well be recorded upon two of the stripes of a CinemaScope print. Each track is reproduced on a speaker on the stage, the two speakers being arranged so that their beams cross in front of the audience—another point of difference from the stereo installation in the motion picture theatre.

The purpose of the delay device was to feed auditorium speakers. The outputs of the two tapes were combined, and fed with variable delay to low-power speakers concealed around the auditorium. The delay was so adjusted that one heard the sound from an auditorium speaker a fraction of a second *after* the sound had arrived from the stage speakers.

This, Dr. Kleis explained, is vital to stereophonic reproduction. In this country, auditorium speakers fed from

(*Continued on page* 37)

★

Season's Greetings

to the thousands of craftsmen whom we have been privileged to serve with fine cinematic equipment.

★

C. S. ASHCRAFT MFG. CO., INC.

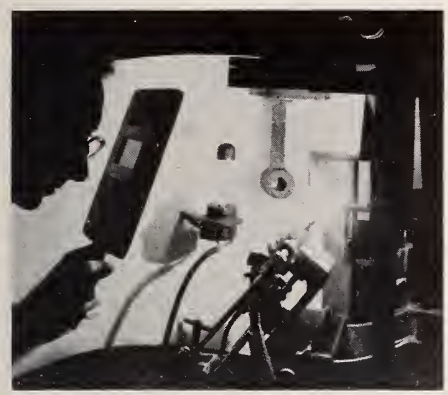
36-32 THIRTY-EIGHTH ST. LONG ISLAND CITY 1, N. Y.

Arc Lamp and Rectifier Specialists for Over 35 Years

Stepped-up research for better motion-picture lighting is now being conducted by the National Carbon Company.

National Carbon's New Labs

SCREENING of motion pictures and the lighting of motion picture studios both require the precise collection and accurate projection of light produced by the carbon arc. Basic research in light sources for the motion picture industry therefore calls for an examination of the carbon arc itself, and the optical systems with which it is used in the projection room or studio. The new multi-million-dollar research laboratories in Parma, Ohio, of the National Carbon Co., a division of Union Carbide and Carbon Corp., are equipped for extensive basic research in these fields.



Temperature of a carbon arc may approach 12,000° F., the temperature of the sun's surface. The arc under examination above is so bright that its beam casts the shadow of a 200-watt tungsten lamp. There is no brighter artificial light source.

An outstanding feature of the new laboratories is a combined auditorium and "theatre" that makes projection tests possible under actual operating conditions. Although conventional small auditoriums are wide and short, with the seats arranged in curved rows, the auditorium-"theatre" at Parma is long and narrow, permitting a projection throw of over 100 feet. This auditorium is wide enough, however, to permit the installation of a large screen to simulate theatre conditions.

The projection-room design is based on years of experience and planning. Containing the latest equipment, this projection room has three ports—one for 16-mm projection, one for 35-mm, and one for spotlight-arc unit for slide projection. Two 500-ampere electrical circuits supply power for both standard and experimental carbon arcs. Automatic remote controls raise and lower the screen from the projection room.

A control panel selectively feeds the output of nine barrier layer cells (photo exposure meters) installed at various points on the surface of the screen to a meter in the projection room. This makes it possible to obtain both light output and distribution data required to evaluate a wide variety of both carbons and optical systems.

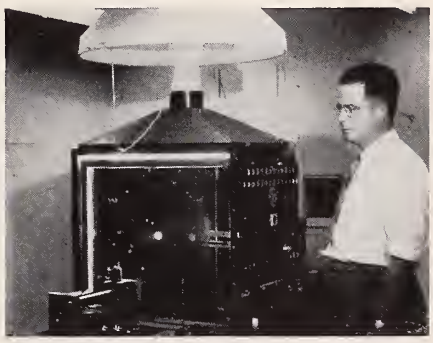
Just off the projection room is a large laboratory for basic research on carbon arcs and optical systems. Special equipment includes one of the few recording spectroradiometers in existence, a recording spectrometer, and a special experimental lamp made to National Carbon's specifications by Mole-Richardson.

Continuing basic research will be carried on at Parma and at National Carbon's projector carbon development laboratory at Fostoria, Ohio, where the "Oscar"-winning yellow-flame carbon for motion picture studio lighting was developed, in order to keep pace with technological advances by the motion-picture industry.

Motion picture lighting, however, is only a part of the work conducted at the Parma laboratories. We have a tendency to think of carbon mostly in connection with arc lamps, but this versatile element is essential to the operation of almost every industry. Carbon brushes, for instance, are vital to every electrical generator and motor, and graphite electrodes feed power to electric arc furnaces that produce steels.



A view of the auditorium-theatre at National Carbon's Parma Laboratories showing the room being used for a technical lecture. By pushing a button in the projection room, a large screen can be lowered for either carbon arc research or auditorium viewing. Behind the curtain is a bank of 9 photocells connected to meters in the projection room for measuring light on the screen.



Specially built by Mole-Richardson to National Carbon specifications, this lamphouse for experimental use is employed to evaluate both optical systems and carbons. It is adaptable to any type of optical system, and its water-cooled electrode holders can accommodate carbons up to 13.5 mm. The entire assembly is mounted on a turntable for maximum flexibility.



The scientific instrument being used here to study the color output of a carbon arc is called a recording spectroradiometer. It measures the relative amounts of various colors in the light beam and records them on a chart. By studying the results researchers can compare the color quality of an arc's light to the color characteristics of the color film. Light meters in the background measure the intensity of the projection beam to determine the distribution efficiency of a lamp's optical system as well as overall light output.

The function of this department is to provide a forum for the exchange of news and views relative to individual and group activities by members of the organized projectionist craft and its affiliates. Contributions relative to technical and social phases of craft activity are invited.

In The SPOTLIGHT

WE ARE very grateful to our many friends for the gracious cooperation extended this department during the past year. To one and all we say "thanks" and extend our best wishes for

A Happy and Joyous Holiday Season

• The members of Los Angeles Local 150 are congratulating their business representative, George Schaffer, on the contract he recently negotiated for the road show picture "The Ten Commandments," current attraction at Stanley Warner's Beverly Theatre. Among other benefits, Schaffer obtained a total of 28 hours per week preparatory time to be split between the two projectionists, with an extra two hours' prep time for the swing man. The "reserve seat" policy prevails with only one performance each shift.

• Contract negotiations between Pittsburgh Local 171 and 36 independent theatres are deadlocked due to the Local's insistence that a welfare program be provided for its members. Meetings have been held since the expirations of the old contract—August 31 last—but to date no settlement has been reached.

• The Nebraska State Association of IA Locals held its annual meeting December 5th at the Stratton Hotel, Grand Island, Nebr. Among the guests were members of District No. 9, comprising the states of Iowa, Illinois, Kansas, Minnesota, Wisconsin, S. Dakota, N. Dakota, Missouri, and Nebraska.

• Charles Harcum, member of Dallas Local 249, is pinch-hitting at the Majestic screening room for Clarence Nix, who entered the Baylor Hospital in Dallas for a checkup.

• Carrol Gates, projectionist at the Franklin Theatre in Detroit, Mich., suffered slight injuries while trying to extinguish the flames caused by burning film in the projector. Unable to put out the fire, Carrol made his escape. The two-alarm fire was confined to the projection room and the 100 patrons in the theatre all escaped safely.

• Florida seems to have become the haven for retired projectionists. Maurice Moriarty, member of Local 273, New Haven, Conn., has retired from his job as projectionist at the Paramount Theatre in that city and will now make his permanent home in Florida. Moriarty worked at the Paramount for more than 35 years and is a former official of the local.

• For a wealth of experience crowded into 18 years (and that includes war service) consider Albert Goldman, member of Local 182, Boston, Mass. Currently a projectionist at the Beacon Hill Theatre, Boston's top art house, Goldman, now 38, has also served for many years on the Local's seniority committee. He has his own 16-mm projection equipment for local showings, and runs pictures for the Jam Handy showings in Boston. At times he also works for Stagehands Local 11 in Boston, when extra men are needed, and is usually picked to work the Metropolitan Opera when it plays Boston.

One of the first 16-mm projectionists on a commercial basis in the Boston area, Goldman received much of his experience working for Joe Cifre, now retired. During World War II, Goldman was with the 32nd Infantry, Red Arrow Division, and he and three other men constructed and maintained the famous outdoor and indoor Red Arrow Theatres, where they played to as many as 2500 men at a time. For this work he twice received the Army Commendation Medal.

Goldman says he knows this sounds like a great deal to crowd into 18 years, "but I have been very fortunate in being in the right place at the right time, and am thankful for my IA membership."

• Conrad Krieger, secretary of Local 586, Grand Island, Nebr., was recently elected fifth vice-president of the Nebraska State Federation of Labor, AFL-CIO.

• The following letter from A. Montague, president of the Will Rogers Memorial Hospital, addressed to Morris Rotker, member of New York City Local 306 and past president of the 25-30 Club, is self-explanatory:

"It has been brought to my attention that you are responsible for the Copper Drippings Plan to benefit our Hospital Fund. At this period of the year when we review our blessings and give thanks for all the benefits we have received during the year, may I, on behalf of my

THE FATEFUL NIGHT WHEN THE CLOTHESPIN SLIPPED



"Gad, Chandler, all is lost!!!"

Drawing by Ed McCormack, L. 582, Brantford, Can.

The Old Cranktwister

Detroit's self-proclaimed dean of projectionists tells how he educated a heavy-handed Russian who couldn't keep the picture inside the masking when switching to 'Scope.

THE OFFICE of Chairman of the Teck—Nologic Committee, charged with the duty of straightenin out these young squirts, kin be downright discouragin at times. It seems like this young crop of projectionists who never served their apprenticeship on 5/8" top and bottom at 40 amps just cant figure nothin out for themselves.

For instance, you take this boy Ivan Runoff, a white Rooshin an our youngest member. We took this feller Runoff in our Local during the war. As the then Chairman of the Examinin Board your co-respondent was strictley agin takin in any operator with a name as suspicious as all that. But that dratted Kaiser Wilhelm, and his war to make democracy unsafe for the world, caused such a terrific manpower shortage in our jurisdiction that necessity overruled the unerring judgment of the chairman.

On his job at the Pearley Gates Theatre this boy Runoff now has continual trouble fitting the picture to the masking when he shifts from regular to widescreen, and vice versa. Either the picture comes on too high, or too low. and the Boss is utterin sourcastick hints to the effect that —a change to more experienced tecknickle personell might take place.

With a steep projection slope, and lack of exact aperture registration in his three sets of plates, it is necessary for sidewise correction to loosen the four wing bolts on the table of his heavy duty Simplex base. And thats just where the chain of Ivan's difficulties begins.

When them holddown bolts are loosened for a shift — *up* comes the table threatenin to leave the pivot pin, and the reason for this clear as porthole glass oughter be, an usually aint. Evidentley the base was designed under the assumtion that the lamp end would always be heavier than the head. But time marches on an with it came sound. With the optical head an drive motor now mounted out in front the reverse condition is true.

The last operation in effecting a shift is to lock the four holddown bolts—the direct cause of Ivan's difficulty. With the enormous optical leverage of a 150 foot throw, the slightest variation in lockdown tension from the previous setting produces an off-the-mask picture.

Ole Twister happens to know that lack of aperture registration between the various plates aint peculiar to Ivan's equipment alone. Therefore, the egostical and proud would do well to adopt the remedy to the problem as resolved by this master projectionist. At this point, a proper expreshun of concern is due the other members of the Committee for any hurt feelings.

With the holddown bolts locked down tight (so your projector wont fall over on its nose) you remove the pivot pin. Then, replace the pivot pin with a bolt, head up, and backed with a washer. When the holddown bolts are now released the table cant rise because, the pivot bolt head and washer holds the table in fixed relationship to the base. The four wing bolts may now be left loose and cherished for their decorative value.

FRANK MACDONALD
Local 199, Detroit, Mich.

fellow officers and directors, express to you our appreciation of what you are doing to aid the Will Rogers Memorial Hospital and Research Labs."

Many IA Locals from all parts of the country have inaugurated similar "save copper drippings" drives and, judging from the many letters we have received, are receiving the enthusiastic support of their members.

• In appreciation of his untiring efforts to aid in the care and rehabilitation of crippled and underprivileged children, Harry Garfman, Brooklyn business representative for Local 306, was presented with a plaque at a testimonial dinner given in his honor. The dinner was held at the Elegante Restaurant in Brooklyn, on December 7, and was attended by heads of the various institutions that benefit from Garfman's efforts.

• Milwaukee Local 164 tendered a midnight banquet last month in honor of ten veteran members, now retired. The affair was held at Machinists Memorial Hall and was attended by practically the entire Local membership in addition to a number of Milwaukee's leading theatre men. Two of the retired members, Rudolph (Chet) Miller and Joseph Greene, each with a record of 27 years of service with the Riverside Theatre, were presented with gold watches. Gold passes of admittance to any theatre in Milwaukee were presented all ten veteran members: John Black, William Bodenstein, John De Lorenzo, Greene, John Jahnz, Armour Langson, Edward Medower, Herman Trampe, Jerome Washicheck, and Willert. The party was arranged and planned by Local officials Glen Kalkhoff, president, and Oscar E. Olson, secretary and business representative.

• West Coast IA Locals are up in arms against those so-called "runaway" American producers who, for tax gains, have been making pictures abroad for exhibition in this country. It is said that many of these productions employ Communist workers, thus depriving American craftsmen of work that rightfully belongs to them. The Locals have recently served notice on the industry that in the future the American public will be kept informed of all motion pictures made abroad for tax evasion purposes. The titles of these films and the names of the American companies producing them will be publicized, warns the Locals.

According to recent trade press reports, Cameramen's Local 659 in Hollywood is planning to unite with the Screen Actors Guild in a joint effort to combat the "runaway" production abroad.

Holiday Greetings and Best Wishes

25 I.A.T.S.E. N.Y.C. 30

To Our Many Friends Everywhere

Readers' questions are invited.

Projection CLINIC

Frequent Flaws in TV Film Presentation

WHILE the pictorial and the sound quality of TV does not even begin to approach the high quality of modern theatre motion pictures, there seems little excuse for the extremely slipshod manner of presentation so often received from the smaller stations. Manned largely by broadcasting personnel, one would normally expect all the faults of TV to reside in areas other than the production and broadcasting of an acceptable video waveform signal. But in spite of this, loss of image definition, "ghosts" due to oscillation in video amplifiers, loss of tonal range with filled-in shadows and washed-out highlights, improper contrast adjustment, and multitudinous camera errors are evident in pictures picked up by viewers' aerials every hour of the day.

And yet it would be unfair to blame the radio-trained operators of TV broadcasting equipment for all of the pictorial faults of TV. Many TV technicians, in fact, do work so good that it must be considered truly remarkable in view of prevailing conditions in most small TV studios. Our criticism is directed only toward a ubiquitous minority incapable by temperament and experience of evaluating the niceties of pictorial quality to correlate the characteristics of the video waveform with those of a sharply resolved image of wide tonal range and pleasing appearance.

But much of the poor quality of TV begins just where we should least expect to find sloppy work, namely, in the film-processing laboratory. For laboratory men, even those who work primarily in the 16-mm TV field, have at their disposal nearly all of the technical facilities of professional film production and (if we are not too generous in our assumption) at least a smattering of professional-film printing and processing know-how.

Bad Laboratory Work

LACK of sound synchronism in 16-mm TV films is so common as to be appalling. It is not difficult to match a sound negative with its corresponding picture negative and to supply each with a printer's start frame. Even in the absence of clapstick marks, any film cutter with a moviola and average eyesight can establish lip sync within 1 or 2 frames. But TV films are requently as much as 4 to 12 frames out of sync! Not only is the illusion of reality destroyed (the public feels that "something is wrong" when picture and sound are at little as 4 frames out of sync), but, also, whatever dramatic value the film may have possessed is nullified.

Even theatre footage, already supplied with accurately placed printer's starts, often arrives at the TV studio in 16-mm reprint form so far out of sync that we are reminded of sound-on-disk and groove-jumping needles. This sort of thing disappeared from the theatre field with the abandonment of Vitaphone records.

No less annoying is the apparent inability of 16-mm printers to reduce at least a few of the scene-to-scene disparities in overall image density so frequently found in theatre films. The direct projection process used with an adequate light source can reproduce anything on film; the TV process is sadly deficient. The old rule of "3 printer steps lighter for TV" may help, but it fails by a long shot to tailor a wide-range theatre film to the limited contrast-brightness characteristics of the vidicon camera tube.

It shouldn't be too difficult to cue a master positive or duplicate negative for brightness corrections when printing for TV. Low-key scenes should be more contrasty than normal; high-key scenes less contrasty. No less a personage than Walt Disney, whose theatre-release prints are pictorially faultless, should devote at least a moment's thought to the woefully limited film-reproducing capabilities of hole-in-the-wall TV studios booking "Disneyland" on 16-mm.

Poorly Made Receivers

THE PICTORIAL limitations for TV broadcasting are further limited by TV set manufacturers who rely too heavily

★ ★ ★

Season's Greetings

NATIONAL CARBON COMPANY

A Division of Union Carbide and Carbon Corporation

NEW YORK

★ ★ ★

Greetings and Best Wishes

We welcome this opportunity to extend the Season's greetings to our many friends in the projection craft who, working together with us thru the years, have enabled us to progress in the drive-in theatre industry.

F. W. Keilhack *L. E. Higginbotham* *H. E. White*

DRIVE-IN THEATRE MANUFACTURING COMPANY

505 West 9 Street **Kansas City 5, Mo.**

upon their experience in the exclusively non-visual field of radio. Plenty of "cheating" is permissible in sound, but not in pictures. Few TV-set manufacturers have ever built a camera, printing machine, or projector. Ads for TV sets are usually calculated to entice a technologically innocent public into buying what is regarded primarily as luxury furniture, and only secondarily as audio-visual apparatus.

The absence of automatic voltage regulation in the brightness circuits of the average commercial TV set emphasizes nearly all the brightness-contrast defects of broadcast video signals and effectively prevents satisfactory reproduction of low-key scenes.

The public, unfortunately, has come to accept the fogging of low-key scenes and the brightening of fadeouts to a light gray as unavoidable characteristics of the TV process. Actually, this intolerable defect of TV has been created by manufacturers who choose to sacrifice the pictorial performance of their "luxury furniture" for a saving in manufacturing cost amounting to only about $15 per set. Can you imagine a manufacturer of theatre projectors omitting the framing carriage or the lens-focusing knob to save a few dollars?

Choosing Carbons

ONE MORE thing to be remembered—don't defeat your purpose through using larger positive carbons if you have increased your arc amperage by only 5 or 10 amps. Suppose you have been burning 9-mm carbons in a 16½-inch mirror lamp at 85 amps. This has been giving you about 19,000 lumens (no shutter, standard aperture, *f*:2 coated lens). You then step up the current to 90 amps. and change to 10-mm carbons. Your light output has then become approximately 16,000 lumens, a *decrease* of 3,000 lumens! But if you had kept on with the 9-mm carbon at 90 amps., your light would have been 21,000 lumens, an *increase* of 2,000 lumens.

Use the smallest size of positive carbon possible with the current you are burning. Smaller carbons give you more light, but burn up at a rather rapid rate. Larger carbons give less light for the current, but burn relatively slowly. Whether or not to use heat filters is another problem which may rear its ugly head. For a complete discussion of this matter, see "Film and the Heat Problem" by Bob Mitchell in the March 1956 issue of IP.

Bent Shipping Reels

WE THEATRE projectionists are well aware of the evils attendant upon the use of battered shipping reeels and film cans. Prints are thereby torn and otherwise mutilated, necessitating cuts irrespective of the subject matter in the footage removed during the repair of prints. The footage left in the reel ordinarily gives acceptable results soundwise and picturewise (otherwise it would not have been left in), and only the perforation margins of 35-mm film are likely to be scratched.

It is a different matter in the case of the 16-mm prints used for television. The soundtrack on 16-mm sound films is located in the edge-area formerly occupied by one of the two rows of perforations in 16-mm silent film. Moreover, the narrow width of 16-mm film increases the likelihood of abrasion by the flanges of 1200-, 1600-, and 2000-ft. reels.

Abrasion in 16-mm soundtracks is very much in evidence on TV. There is sometimes a continuous level of sputtering and hissing noises, but more often a periodic "swishing" that points an accusing finger at the reel. The use of bent reels in 16-mm work is accordingly very much more serious than in 35-mm projection.

We have examined a number of the shipping reels used by 16-mm film exchanges, and we have seen battered shipping reels used for projection purposes in the smaller TV studios. On they go, right out of the can, often without prior inspection of the film! Is it any wonder that 16-mm soundtracks sometimes sound like a delegation of Dutch housewives sweeping down the cobblestones?

First New Zealand Drive-In

An application to license the first drive-in theatre in New Zealand has been favorably received by authorities in Sidney. Until recent months industry opinion had been that drive-ins would not be good commercial propositions in New Zealand, since the total population of about two million is already "overseated" with the world's highest ratio of theatre chairs to population.

Best Holiday Wishes

from Century

to projectionists throughout the world whose effort and skill have helped so much in the task of modernizing projection methods.

Century Projector Corp.

729 Seventh Ave., New York, N. Y.

LETTERS TO THE EDITOR

IP Found Helpful

To the Editor of IP:

I am very much pleased with the sample copy of IP I just received and intend to take a two-year subscription. Also, I am interested in obtaining some information printed in previous issues. Would it be possible to obtain the June and July issues containing Robert A. Mitchell's article, "A Common-Sense Approach to Screens, Apertures and Aspect Ratios?"

More exhibitors and managers should subscribe to your publication so they could learn about the numerous limitations a projectionist works under when trying to accommodate a multiplicity of new techniques with projection equipment that is old or makeshift.

Furthermore, it should be realized once and for all that the wide screen is not a cure-all for every industry ailment. As one practical Hollywood producer recently stated: the wide screen is a great success —in making a poor story twice as poor. This statement certainly applies to technical defects in the camera system as well as to poverty in the story material.

LOUIS GOLDSTEIN

Dorchester, Mass.

COMMENT: We thank reader Goldstein for his interest in IP. He and any other readers desiring back issues of IP can obtain them if available at a cost of 30 cents each. However, those wanting previous articles by Robert A. Mitchell can obtain a convenient newly published collection of the best of his articles, all of which have been carefully revised and brought up to date by the author. For the time being this volume is available through IP at a special pre-publication price of $4.50. The regular price will be $6.00.

Supports Magnetic Sound

To the editor of IP:

Here's my opinion in regard to Robert Mitchell's article in the September issue about magnetic reproduction for motion pictures.

If every theatre owner could readily afford all the new equipment now available, and if they were all good showmen, they would certainly do as we are doing here—request magnetic prints wherever possible. But that does not happen to be the case. Since the great majority of exhibitors will never buy anything they possibly get along without, it is evident that optical reproduction will be with us for a long time to come.

To that extent I agree with Mr. Mitchell. But, since magnetic reproduction has been enthusiastically accepted by the theatre public, I feel that it is here to stay. I would also like to point out that unless this industry continues to progress, we will have less and less of an audience to worry about.

AL KUIPER

Terrace Theatre
Minneapolis, Minn.

COMMENT: The motion picture industry can survive in this competitive age only by making use of every available technological advance—and by continually devising new ones! Most of the exhibitors who wail and moan about bad business continue to employ projector mechanisms of the 1920's and sound systems and arc lamps of the 1930's. TV has reached a new low in entertainment value; but many people, after a hard day's work, prefer to stay home and sleep through TV's loudly moronic fare than bother to attend shabby, outmoded theatres having sloppy projection and sound.

The installation of CinemaScope or some other form of wide screen is hardly enough to compensate for dim, unevenly lighted pictures shown out of focus or for the distorted "restricted-range" sound produced by old-fashioned sound systems.

Mr. Kuiper has succinctly expressed the theme we've been harping on for many a long year. Use of the best equipment available is a mighty important factor in true showmanship. But how many exhibitors operating older houses (downtown or suburban) qualify as real *showmen?* Not very many, considering the number of old-established theatres which have either slumped into the red or closed their doors forever.

An incompetent projection crew may indeed practically destroy the popularity of a theatre, but the best projectionists in the world are helpless when their hands are tied by managerial indifference and stupidity.

The Stereophonic Factor

To get to the specific matter of sound, this writer personally feels that Mr. Kuiper is making a comparison between *single-channel* optical-track sound and *stereophonic* CinemaScope magnetic-track sound. This would not be a very useful comparison, however, because, when properly handled with prints and equipment of good quality, the full stereophonic process is capable of supplying better results than any outmoded "one-horn" process, no matter how good the optical track may be.

It is a question, we may add, whether the stereophonic type of reproduction is more *realistic* than single-channel sound played through side and center speaker units simultaneously. (This question has nothing to do with the "faked" nature of

(*Continued on page* 34)

★

Holiday Greetings to Everybody

CLAYTON PRODUCTS COMPANY

3145 Tibbett Avenue **New York 63, N. Y.**

Season's Greetings

from the makers of

HEYER-SHULTZ

Precision Metal Reflectors

GENEVA MOVEMENTS

(*Continued from page* 19)

the 60-degree cam action, employed a three-blade shutter with three 64-degree blade coverage, but the mechanical knocking of the pin as it enters the slot in a non-tangential path, made this movement noisy and susceptible of rapid wear. However, the writer operated many of these No. 3 Pathe machines. In spite of long years of continuous duty, these mechanisms performed well and not too loudly. It is also a fact that this film transport mechanism handled the film without excessive wear on the film perforations.

In Fig. 5 is shown the four-slot geneva star wheel and cam pin with 90-degree cam action. A brief study of the drawing will disclose the following: If the radii of pin gyration and the star wheel radii are taken as one, the pulldown angle is equal to 90 degrees and the geometrical distance between the star and cam-pin axis must be equal to 1.41. These are the geometrical requirements for 90-degree geneva cam action. Shown in Fig. 6 is the geometrical alteration made by Cotinsouza on the geneva star and cam pin to get a 60-degree pulldown action, and how the center distance becomes close to 1.91 by altering the cam-pin disk diameter. This alteration gives a 60-degree pulldown cam action.

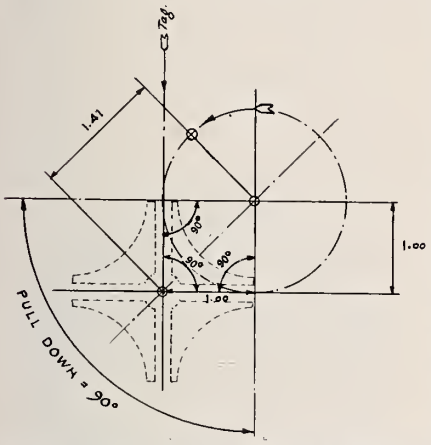


FIG. 5. Standard geneva movement showing geometrical relationship necessary for 3-to-1 pulldown ratio.

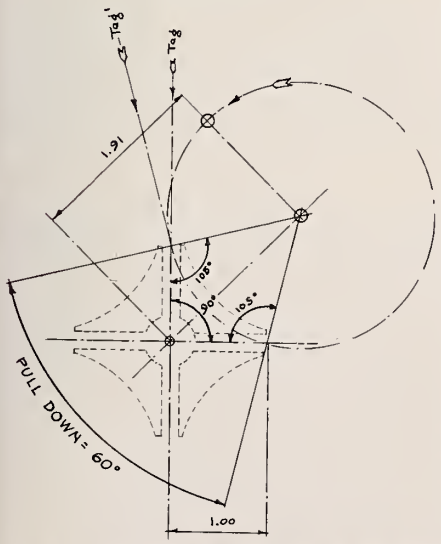


FIG. 6. Alterations in star wheel and cam pin to obtain faster pulldown in Pathe-Cotinsouza movement.

In the Cotinsouza design the tangential path of the pin at the beginning of pulldown cycle becomes non-tangential with a shift angle of about 15 degrees, thus there is a strong knock by the pin against the slot faces (see Fig. 7). Although this type of geneva intermittent may be a solution in reducing the pulldown action, it is not ideal for obvious mechanical reasons.

A second method of obtaining a 60-degree cam action is to employ a three-slot geneva star wheel. In some relatively old RCA television film projectors (35-mm), such as the RCA-IP-35 model, this expedient was employed. It has also been used as a speed multiplied for 16-mm TV projectors when linked to one rapid claw intermittent mechanism. This type of geneva star wheel design is anti-mechanical in practice, as well as dangerous for film transport movements. The exaggerated leverage of the pin radii upon the star wheel is very bad and no doubt impractical. The three-slot geneva star wheel was described and discussed by Mitchell in the September, 1952, issue of IP.

The drawing in Fig. 8 depicts the classical design of Pathe intermittent movement with the 60-degree pulldown. These mechanisms were widely sold in Europe and America, and were later replaced in the world market by American and other European projectors, such as Powers, Simplex, Motiograph, Ernemann, etc.

Adaptability Required

An important factor in the design of a new intermittent movement with faster action is the question of adaptability. The movement must be designed as far as possible to fit any machine with a minimum of dimensional variants. The ideal approach for new movements is to keep the mechanical design as close as possible to the conventional movement, with only two parts in motion as in the geneva star wheel and the cam pin.

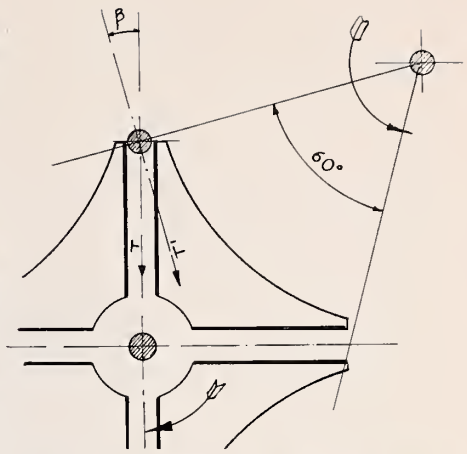


FIG. 7. Non-tangential path of cam pin in Pathe 5-to-1 geneva movement.

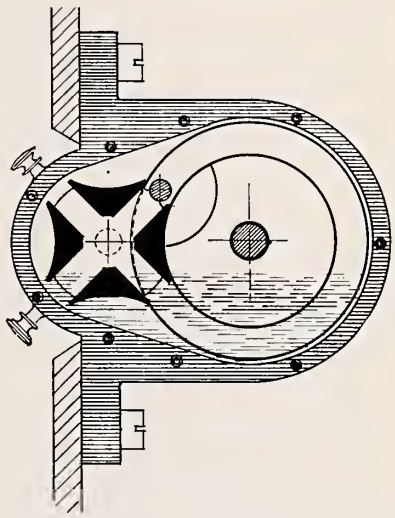


FIG. 8. Drawing of actual Pathe 5-to-1 intermittent movement.

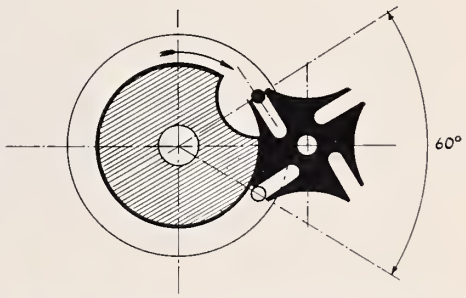


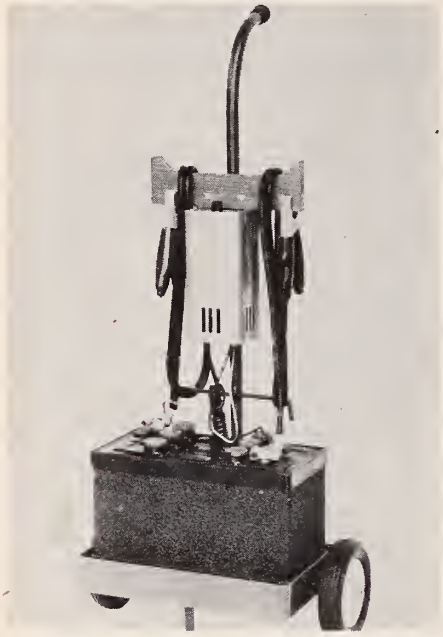
FIG. 9. Eccentric-star intermittent which uses enlarged cam but avoids off-tangent relationship between cam pin and star wheel by altering position of star-wheel slots.

The eccentric-star intermittent movement fills this requirement. This moveemnt was a product of Pathescope Co. of America, which as early as 1920 produced a 28-mm safety film projector with a 60-degree pulldown by means of a speeded-up eccentric star. The eccentric star wheel design was a Cotin-

(*Continued on page* 31)

New Products for the Industry

HANDY FOR DRIVE-IN THEATRES, as well as drive-in patrons is the new Christie Redi-Start. a portable battery booster cart. distributed by National Theatre Supply. Stalled cars with run-down batteries need no longer encumber drive-in premises. The Redi-Start booster retains a constant high charge for turning over engines. Compact and easily wheeled, the unit consists of a two-wheeled cart mounting a 12-volt battery and a 12-volt charger which keeps the battery ready

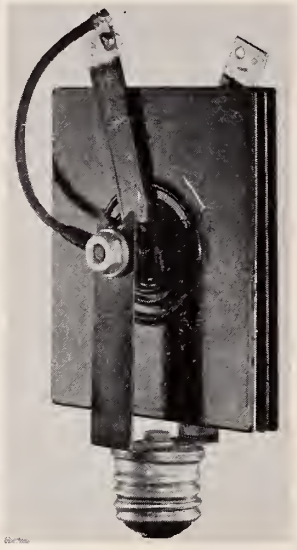


Redi-Start booster for drive-ins

for use at all times. When not in operation. the charger is plugged into a 115-volt outlet. To start a car, two plier clips are attached to the battery posts of the dead battery. The unit is priced at $49.95. FOB Los Angeles, Calif.

A NEW CURVED TRAP AND GATE UNIT is now available for replacement of the straight trap and gate unit in Century projectors installed in theatres. The new unit is similar to standard Century design, but is curved from top to bottom, calculated to eliminate "normal" film curl, reducing tendency of film to buckle. The curve over the height of the aperture is not enough to cause any focusing difficulty, and it is considered that there is an improvement in the top-to-center-to-bottom focusing when using short-focus, high-speed lenses.

The new unit may be installed in present projectors without additional machining, drilling or tapping holes, or special tools.

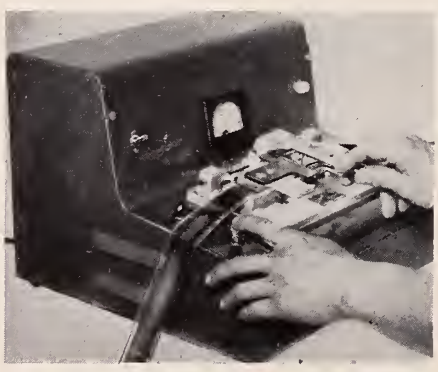


Kneisley Sel-Tube for converting tube rectifiers to selenium operation.

A SELENIUM rectifying agent, known as the Sel-Tube and designed to replace the conventional 15-ampere rectifier tube used in 40-, 50- and 60-ampere rectifiers, has been announced by the Kneisley Electric Co.. Toledo, Ohio. These units are arranged in such a manner that they fit into the space formerly occupied by the tubes, all electrical connections being accomplished in the socket shell itself. No external wiring is required.

A forced-air ventilating system to cool both the Sel-Tubes, and transformers is added to the rectifier housing after the Sel-Tubes are installed. According to Kneisley, elimination of all filament loads and the reduction of tube voltage drops make it possible to obtain greater output, or to reduce input power to the rectifier for power savings if sufficient output power is already available.

AN ELECTRONIC SPLICER said to be equally effective for Cronar or Acetate films does an almost instantaneous job of welding film together without adhesives.



The Shepard electronic all-purpose splicer

The Neumade Shepard Electronic splicer uses dielectric heating to bond the ends together in less than a second by internally generated heat. This splicer handles 35-mm, 16-mm, and 8-mm film and performs its function for different types and sizes such as CinemaScope and standard perforations. Overlap is narrow—only .03 inches and bond is permanent and durable. On application of a pressure plate, intense high frequency energy is applied to the overlapped area causing the film to fuse. The Shepard splicer comes in a baked enamel finish and operating parts are silver plated. Electrical input is 117 volts, 60 cycle with standby power consumption rated at 50 watts.

A HEAVY-DUTY CHOKE for use in the output circuit of a rectifier to suppress screen flicker caused by ripple in rectified current is available from the Kneisley Electric Co.. Toledo. A heavy-duty choke minimizes this ripple to the extent shown in the accompanying oscilloscope chart. Without the choke, the wave form covers 31 sections of the chart in height (dotted line). With the choke, only 17 sections (solid line) are covered. a reduction of 45.5%.

The choke must be of the heavy-duty type so that voltage drop and subsequent



Oscilloscope chart shows reduction in ripple in rectified current through use of heavy-duty choke. Without the choke, the wave form indicated by dotted line covers a much larger area of the chart. Solid line indicates wave form with choke in use.

current loss is negligible. The unit measures 10 inches in height, 9 inches in width, 7 inches in depth. and weighs 56 pounds.

IMPAC, a non-breakable, chip-proof, colorfast casing material developed by RCA. is now being applied to the theatre equipment field as an in-car speaker case for drive-ins. The same casing material used for RCA Victor portable radios, "Impac" is claimed to provide exhibitors with an in-car speaker that will not age in service. despite weather abuse and overall wear-and-tear in handling.

The lowest cost RCA in-car speaker,

the "Impac" product incorporates RCA's regular in-car speaker mechanisms. The design features a tapered tear-drop shape in two-tone color and a lattice pattern speaker grille, front and back.

The speaker is now available through RCA theatre equipment supply dealers in major cities.

USE-A-STUB, a stub holder for rotating carbons, is now being distributed by Doc Faige & Associates, New York City. Developed by Howard Neilson, projectionist-inventor, the holder allows carbon stubs to be used as is, requiring no processing at all. "Use-A-Stub" is factory adjusted for desired carbon diameter. A tension screw allows the projectionist to make such adjustments as are necessary for carbons that may vary slightly in diameter.

"Use-A-Stub" rotates with the carbon stub until the holder reaches the carbon jaws. At that point, a recessed stub continues to feed the stub forward inside the silver jaws another ¾ inch, thus utilizing the maximum amount of the carbon stub and resulting in optimum savings.

SCIENCE NOTES

ACCELERATING FINE DUST particles to speeds as high as 7,000 miles per hour has been achieved by the Armour Research Foundation, for the purpose of simulating the effect spaceborne dust may have on future spaceships.

* * *

A SUN-POWERED tubeless radio, said to be the first of its kind designed for consumers, has been developed by Admiral Corp. This new model contains six transistors in place of vacuum tubes.

* * *

COOLING PROTECTIVE SUITS may be best accomplished through use of a midget, battery-powered, air circulating unit instead of present evaporative cooling techniques, according to the Navy Bureau of Supplies and Accounts.

* * *

ELECTRONIC DIAGNOSES may aid doctors in the future, according to RCA. It was suggested that whole series of measurements, such as electrocardiogram, temperature, blood pressure, and others, could be recorded simultaneously by a single piece of electronic equipment operated by a technician.

* * *

A TRANSISTOR that operates at frequencies three times higher than others (up to 600 megacycles) has been announced by Bell Telephone Laboratories. It is expected that the new transistor will be used in guided missiles and electronic calculators.



. . . the SUPER SNAPLITE LENS for the clearest, sharpest, brightest pictures you have ever seen on your screen!

Your patrons will notice the difference — Super Snaplite gives greater contrast, better definition, more light on the screen where it really counts.

Ask your dealer for Bulletin 222.

KOLLMORGEN Optical CORPORATION
NORTHAMPTON, MASSACHUSETTS

The Life of an Early Projectionist

Modern craftsmen will be fascinated by the unique experiences of Francis Doublier, who traveled Europe before the turn of the century, both taking and showing motion pictures with the combination camera-projector developed by the Lumiere Brothers. Doublier is now dead, but following is the text of a talk given by him many years ago at New York University, as it appeared in a recent issue of Image, house organ for the George Eastman House.

I WAS born at Lyons, France, in 1878. A cripple at birth, my father wished to train me for an occupation where it would not be necessary to walk. When I was 12, my father was killed in an accident. After his death, M. Lumière came to my mother and told her that all of us—we were a family of several boys—would find employment in his factory, so at sixteen I went to work for Lumière.

Auguste and Louis Lumière at this time were experimenting on motion pictures like many others and one day, in the summer of 1894, they saw a piece of film from Edison's Kinetoscope. This peep show could be seen by one person at a time. Louis Lumière worked out the famous "triangular cam" and the famous Cinematographe, combination of camera, printer and projector was born. The earliest motion pictures ever taken for the screen were some Lumière himself took of workers pouring out of his factory. I myself am in these pictures, riding a bicycle and wearing a straw hat.

On March 22, 1895, we showed both the camera and pictures we had taken at the Societe de l'Encouragement. The pictures created a great sensation. People were astonished and even panic-stricken to see a locomotive charging toward them. They were amazed at the motion in the pictures. They would say, "See, the leaves on the tree move!" "Smoke comes out of the chimney!" When a picture of the charge of French Cuirrassiers was flashed on the screen, people almost fell into a panic, for they believed the soldiers were charging at them.

I was sent to Madrid in 1895 by M. Lumière to take pictures of a bullfight. M. Lumière gave me his camera, and cautioned: "Do not let this camera out of your sight, Francis." So I carried it around with me every place I went, and even put it under my pillow when I slept. I went from Madrid to Paris, Brussels, Amsterdam, and on May 28, 1896 I was in Moscow to film the coronation of the Czar.

It was the custom that the Czar and Czarina go to a large field just outside of Moscow three days after their coronation to perform some kind of ritual, so I, wishing to film the incident, appeared at the field early on the day of the projected visit and set up my camera on some planks. I went down with the crowd to get some souvenirs made for the occasion—a goblet, and a scarf, with pictures of the Czar and Czarina on them—when a terrible panic was started. Out of a crowd of 20,000 some 6,000 people were killed. I myself was trampled on and caught in the mob, but escaped without injury.

I traveled all over Russia. At one city I witnessed a pogrom. At another, the police destroyed a film I had made of the Prince Napoleon, a member of the Russian royal family, because he had been photographed dancing with the lady of his affections, a professional dancer, and because no picture of a member of the royal family could be shown on a screen without special permission from the authorities.

At this time I was using a film which took just one minute per reel. I hit upon the idea of telling people to come to see the pictures I took because they themselves would be in them. Sometimes I ground the crank for two hours, pretending to take people's pictures, but would actually take only about 60 feet of film.

The Dreyfus affair was still a source of great interest in those days, and out of it I worked up a little film-story which made me quite a bit of money. Piecing together a shot of some soldiers, one of a battleship, one of the Palais de Justice, and one of a tall grey-haired man, I called in "L'Affaire Dreyfus."

Caught in the Act

People actually believed that this was a filming of the famous case, but one time after a showing a little old man came backstage and inquired of me whether it was an authentic filming of the case. I assured him that it was. The little old man then pointed out that the case had taken place in 1894, just one year before cameras were available. I then confessed my deception, and told him I had shown the pictures because business had been poor and we needed the money. Suffice to say, I never showed "L'affaire Dreyfus" again.

I began to travel, going to Turkey, Egypt, India, Indo-China, and Java. I took pictures and exhibited them in all of these countries.

In 1900 I went back to France to film the French Exposition. In 1902 I came to America to open a plant in Burlington, Vt.

From there I went to Fort Lee, New Jersey, where I have remained to this day. I have been in the motion picture business for over 45 years.

Finally, I would like to make just one point: Le Prince, Friese-Green and others came before Edison: they did the groundwork—Edison added a few innovations. And it was Lumière, not Edison, who made the first practical and commercial motion picture on the screen.

Oklahoma Gets Cable Theatre

An experiment in toll TV, a "cable theatre", will be installed in the Osage Theatre, Bartlesville, Okla., in the early Spring. Video Independent Theatres, Inc., operators, have concluded the deal with Jerrold Electronics Corp. of Philadelphia, developers of the system. This will be a test of the medium, which provides that a picture shown in the theatre be sent simultaneously by means of cable to the home TV screens of subscribers, who are billed monthly for the service. Purpose of the test is to compile information on subscribers, connection rates, and the general consumer pattern.

New Zealand Drive-In

Application for what will be New Zealand's first drive-in theatre has been made in the city of Aukland. The idea has met with a favorable reception, although New Zealand has, with a population of 2,000,000, the world's highest ratio of theatre seats to population.



An important part of the modernization program for the RKO circuit's 58th St. Theatre in New York City was the installation of a Vicra-Lite all-vinyl lenticular screen. New marquee can be seen at left.

GENEVA MOVEMENTS

(*Continued from page 27*)

souza modified geneva star.

In this design, as seen in Fig. 9, the slots are displaced with the required angular shift to achieve a tangential path of the pin as it enters in the slot. This movement is a direct and practical solution to speeding up the intermittent mechanism with a minimum of physical alteration. The only objection which could be made to the eccentric movement is that the eccentric star is only able to rotate in one direction, but this is not a serious inconvenience in projector design and operation.

This movement has an interesting property in its motion pulldown cycle. In the diagram shown in Fig. 10 appear some plotted curves for certain types of geneva star wheels and cam-pin arrangements. The pin displacement is shown in terms of cam-pin rotation in degrees and the linear acceleration of the film in inches per second. The curve *B* represents the conventional 90-degree geneva movement; *A* and *C* are movements of less than 90-degree cam action. The curve *C* represents a cam action for only 72 degrees and 42 minutes, and the curve *A* for 86 degrees, 55 minutes and 56 seconds of arc. The curve plotted in *D* represents the eccentric star wheel with only 60-degree cam action shown in Fig. 9. The eccentric star has a gentle start and acceleration curve in the first 45-degree phase, and a decelerated fast action past the half cycle of the pulldown with one nearly 15-degree final stop motion. This makes possible the use of a shutter with narrower blades and, therefore, more light on the screen.

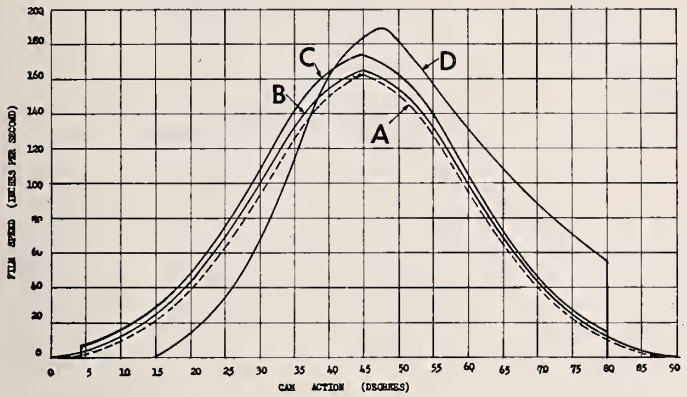


FIG. 10. Acceleration curves for various intermittent movements.

[TO BE CONTINUED]

'Nickelodeons' To Go

Modernized fire laws, aimed at putting out of business store theatres and other "outmoded showhouses of nickelodeon vintage," will be presented to the Minnesota state legislature early next year. The new laws, drafted by the state fire marshal and North Central Allied executive counsel S. D. Kane, may eliminate what is considered unfair competition for top-run Minnesota theatres. They will also prevent showing films "for profit" in halls or schools lacking necessary fire safeguards.



LIGHTING IN THEATRES

(*Continued from page* 11)

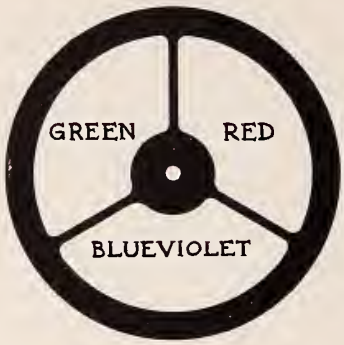
much bluer than ordinary "raw" incandescent illumination. The bluer you make the additive white, the dimmer the total light will be. A *slightly* bluer light than raw radiation is desirable when dimmers or resistors are used, however, to partially counteract the increasing redness of electrically dimmed bulbs.

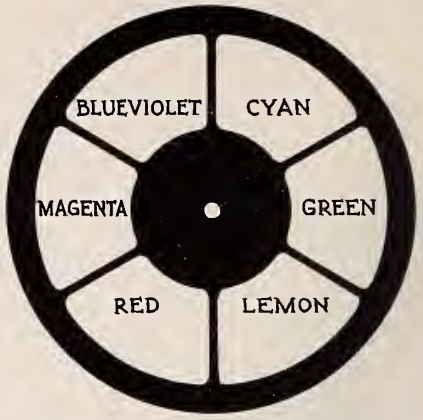
Improving a Spotlight

Spotlights pose a tougher, but more interesting, problem. Different spotlights are differently fitted for color attachments by their manufacturers. Some have a "color wheel" with circular openings covered with colored gelatines, others have lantern-slide arrangements for the insertion of gelatine squares bound between glass plates.

But no matter what type of spotlight is used, dissatisfaction with the color-producing arrangement, especially if it limits the choice of color and prevents smooth transition from one color to another, is a good excuse to consider making an additive or subtractive color attachment.

The first step involves an examination of the optics of the present equipment The secondary focal plane, if any, should be located. This is the point where, if an obscuring sheet of metal is slowly passed down through the beam, the light projected to the stage will dim uniformly with no moving shadows. The focal plane should be in front of the objective lens or, if there be no objective, in front of the condenser or "bull's-eye." It should also be determined if the focal plane remains in the same place while the projected spot is enlarged or reduced in size.





3-SECTOR COLOR WHEEL **SUPERIOR 6-SECTOR WHEEL**

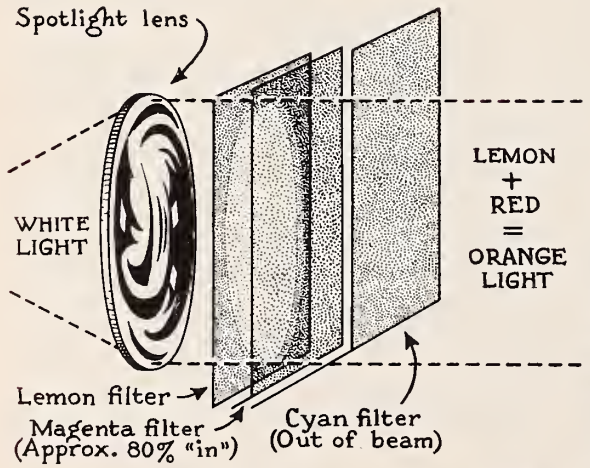
FIG. 5. Here are two spotlight color wheels for smooth color transitions and intermediate hues produced by color mixture. The 3-color wheel on the left requires gelatines in the primary colors for the production of additive mixture hues (carmine, orange, yellow, blue, purple, etc.). That is why *very thin* dividing strips are used between the sectors. The 3-sector wheel is unfortunately just a little inefficient lightwise in the mixture colors. The area of each primary filter cutting the light beam is only one-half what it ought to be for full brilliance when lemon, magenta, and cyan are produced. To overcome this slight defect, the 6-sector wheel shown on the right is advocated *and highly recommended.* It's easy to make, once you obtain all the gelatine filters needed; but remember to arrange the colors around the wheel in the order shown in this diagram. An incorrect sequence of hues will foul up the performance!

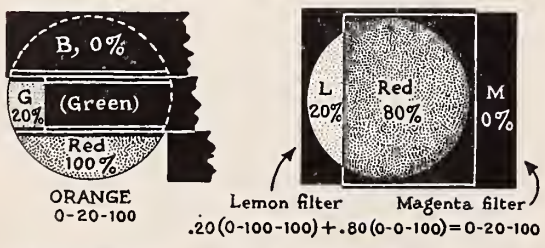
The focal plane thus found is the place where a color wheel—even the simplest—or a trichromatic "color-plexer" for either additive or subtractive color mixing should be placed. If no such plane exists in front of your spotlight lens, then place the color wheel or *subtractive* colorplexer as close to the lens as possible and (we regret to advise) abandon the idea of the highly critical additive method.

A properly balanced blueviolet-green-red 3-strip filter placed in the secondary focal plane will produce white light on the stage without the appearance of color bands.

The accompanying diagrams illustrate the principle of an additive strip filter. Placed in the focal plane of the effect machine, and provided with three adjustable shutters to permit varying the relative amounts of blue-violet, green, and red light projected, a spot of any desired color in any degree of relative brightness and saturation may be produced. Construction of the adjustable shutters may be tricky, but the idea is very simple.

Balancing the width of the three filter strips to obtain white when all three shutters are completely open is a very delicate job. If, after the strip filter is thought to be satisfactory, and it turns out that the white light is tinted, reduce the transmission of the proper strips by ruling opaque lines across them with India ink. *It should be noted that the B, G, and R*





ADDITIVE *versus* SUBTRACTIVE

FIG. 4. The amazingly efficient subtractive colorplexer for spotlights. Instead of the primary 3-strip filter used in the additive colorplexer, this device has three full-size reciprocal-hue filters (lemon, magenta, and cyan). These are arranged to slide in and out of the spotlight beam, one over the other. With suitable reciprocal filters, the subtractive method furnishes from 10 to 100 times more light than the additive method, and is optically somewhat less critical. In fact, illumination efficiency with the subtractive colorplexer is practically the same as with ordinary spotlight gelatines of the various colors. It is an "all-color" device, easily capable of producing all of the thousands of colors our eyes can see.

strips are not necessarily of the same width.

Additive spotlight color is so accurate that calibrated scales, each reading from 0 (no light) to 100 (full intensity) may be attached to the adjustable shutters. A calibrated shutter system makes possible accurate pre-setting of the color combinations and rapid changes from color to color.

While this type of machine produces hues and tints to perfection, shades (darkened hues) do not usually have the appearance of shades except when viewed in contrast with brighter or white areas produced from other sources of illumination. (A brown object looks orange-yellow when illuminated by a small spot of light in a darkened room.)

Reduced Light Output

The chief drawback of additive color for spotlights is the rather great reduction of total available light. The filters may absorb from 70 to 90% of the light, making the additive white very much dimmer than the white obtained from the unfiltered spotlight. Nevertheless, the additive system has found great favor for spotlights used as color accents in TV studios.

The subtractive colorplexer for spotlights, on the other hand, gives the same great range of color (although with less accuracy as regards relative luminosity of the colors), and it has the undisputed advantage of the highest possible light efficiency for a filter system. Loss of light is no greater than with an ordinary color wheel.

The subtractive colorplexer also utilizes three color filters, but each is full size—large enough to completely cover the light beam—and arranged to slide in and out of the beam singly, by twos, or all three for shades and darker colors. The filters, which are reciprocal in hue (lemon, magenta, and cyan), are *superimposed*, one over the other, for mixture colors.

While the job of building a subtractive colorplexer is delicate and exacting, it's worth the trouble. It is not nearly as critical in its requirements as the additive colorplexer; and its wide range of brilliant colors is remarkable. This is the device to build if you want a *bright* colored spot! The accompanying drawings illustrate the general principles involved.

The three filter-slides of the subtractive tripack should be as close together as is practicable. Each must be capable of being moved in and out of the light beam independently of the other two. When all the way in the beam, each filter must cover the beam completely. Mixture hues which are neither primaries nor reciprocals (such as deep yellow, orange, blue, purple, etc.) are formed by one filter covering the beam completely and one of the other two filters covering the beam only partially.

Calibrating System

A calibrated scale may be attached to each filter-slide; and the scales may, if desired, be marked to indicate the approximate specification of the resulting colored light in terms of the primaries. This is a good idea inasmuch as the primary-color readings indicate the actual composition of the resulting colored light.

To calibrate the scales of a subtractive colorplexer in terms of the primaries, regard the lemon slide as the variable blueviolet factor, the magenta slide as the green factor, and the cyan slide as the red factor. To take up the magenta slide (green scale) as an

(*Continued on page* 38)

You can't make the pic better . . . but you can make it click better

How? Squeeze more of the entertainment value — for more of your patrons — out of every product you show. Give the *side*-seat patrons a break — don't let your "half-there" screen rob them of half the emotion. Fill more seats. Find out fast about the

VICRA-LITE

LENTICULAR SCREEN

"the screen of optical precision"



See your theatre supply dealer; write today for factual booklet, containing sample swatch.

L. E. CARPENTER & COMPANY
VICRA-LITE SCREEN DIVISION • Empire State Building, New York 1, N.Y.
In Canada: General Theater Supply Co., Ltd., Toronto

Consistent Maximum Light at Greater Economy

DIAMOND PROJECTION CARBONS

70 PINE STREET • NEW YORK 5, N. Y.

LETTERS TO THE EDITOR

(*Continued from page* 26)

stereophonic movie sound.) Orchestral reproduction almost demands stereophonic sound; dialogue and other single-source sounds reproduced stereophonically are (to quote the opinion of a certain film company) "overbearing" and give "too much effect of movement for front-seat listening, and is of little value in the rear of the theatre. Further, classical stereophonic sound tends to punctuate cuts, and detracts from the smooth flow of the pictured story. For these reasons, and its cost, it has not gained general acceptance."

Multi-speaker reproduction of single-channel sound is something else again. Actual listening tests reveal that it is nearly the equal of genuine stereophonic sound for music, and successfully eliminates the center-of-the-screen effect for voices. It creates "presence." And it is inferior to single-speaker reproduction only when actors talk in open exterior scenes. Under such conditions, naturally, the sound travels directly from its source, there being no reflection or diffusion from walls, ceilings, etc.

It may be noted that the stereophonic effect, whether in real life or as reproduced by the best multichannel systems (using, for example, magnetic tape 1 inch wide or 35-mm film having three 0.2-inch tracks), involves only those frequencies which are higher than 300 to 400 cycles per second. (It may be noted for reference that the keys at the middle of a piano keyboard have this frequency.)

Simplified Stereo System

Sounds below this pitch have no directional characteristics. Systems employing a woofer-tweeter crossover in the 300-400 cycle range, therefore, need only three tweeter channels *and only one bass speaker of sufficient power.* The effect cannot be distinguished from systems employing three *complete* sets of woofer-tweeter units. In speaking of the effects of stereophonic sound, accordingly, we are concerned only with the middle and higher frequencies.

With high-fidelity soundtracks and high-fidelity sound equipment, there is today no excuse for using only one horn combination placed behind the middle of the screen. For the most pleasing reproduction of sound, therefore, it is necessary only to have one center and two side high-frequency speakers with one center low-frequency speaker. The sound reproduction of such a system, all other factors being satisfactory, cannot be distinguished by the average audience from actual direction-changing sound in any but the frontmost seats.

If both magnetic and optical types of soundtrack are in excellent condition and reproduced properly with good equipment, there is no discernible difference in sound quality. Furthermore, audiences cannot detect any difference between 3-channel CinemaScope sound and optical sound reproduced stereophonically *via* the Perspecta Sound process.

In criticizing the CinemaScope narrow-track magnetic sound, high print cost, track instability, the obvious bad features of penthouse reproducers driven by the film, narrow sprocket teeth, the necessity of demagnetizing projectors, splicing complications, and projection

Merry Christmas

Happiness and Peace
to all our friends

●

ACE ELECTRIC MFG. CO.
I. Merker
Member, NYC Local 306, 25-30 Club

. . . IT'S NEW . . .

WILLIAMS PERLITE SCREEN

AFTER MUCH RESEARCH WILLIAMS SCREEN COMPANY HAS ACCOMPLISHED WHAT HAS BEEN THE GOAL OF SCREEN MANUFACTURERS FOR MANY YEARS — THE DEVELOPMENT OF A FINISH WHICH HAS THE BEST FEATURES OF BOTH WHITE AND SILVER SCREENS. THE HIGH GAIN REFLECTIVITY OF SILVER AND THE GREATER LIGHT DIFFUSION OF WHITE ARE ACHIEVED WITH THIS NEW FINISH. THE SCREEN IS ALSO WATER-PROOF, STAIN AND SCAR RESISTANT AND EASILY WASHED.

Samples on request

WILLIAMS SCREEN COMPANY

1674 Summit Lake Boulevard — Akron 7, Ohio

nuisances such as picture-centering, more difficult threading with greater chance of error and film damage, etc. were the principal factors considered.

Life of Optical Tracks

Standard optical-track prints have a longer useful life with better preservation of the sound even though scratches in the soundtrack area introduce sufficient noise to constitute a real problem in certain cases. But magnetic tracks often pick up annoying noises and deteriorate in signal strength, high-frequency losses being the most serious.

It may be admitted, and has previously been pointed out in these columns, that the use of magnetic-track prints by only a small percentage of theatres has worked, so far, to supply these theatres with magnetic prints in much better condition than many of the optical prints encountered in theatre projection. Even subsequent-run magnetic prints are usually quite good: they simply haven't been used much, most theatres using the optical versions.

What Mr. Kuiper says about using the best modern means for picture and sound should continue to be extended to the equipment-production level, and specifically in the direction of optical sound. The full capabilities of optical sound have never been realized, thanks to the introduction of magnetic sound just at the time when conversion to push-pull tracks seemed inevitable.

Even the majority of the theatres using optical sound today fail to get anything remotely resembling the hi-fi quality of the optical tracks released by most companies at the present time. (There *are* a few offenders, even among the majors. One of the largest American studios seems utterly incapable of recording music in *any* medium!)

It is ridiculous to accept as gospel truth the false thesis that the development of photographic sound came to a dead stop in the 1930's. The use of push-pull-optical and wide-track magnetic originals and masters, as well as the ultraviolet recording of release-print negatives, are only a few among the developments which have raised the quality of optical tracks to the point where they compete in sound quality with the best magnetic tracks of the narrow CinemaScope variety.

R. A. M.

BOOK REVIEWS

THE CINEMA TODAY, by D. A. Spencer and H. D. Waley, Oxford University Press, 1956, 202 pp., $2.00.

This edition is an up-to-date revision of the English volume that originally appeared in 1939. The authors, recognized authorities in their field (Dr. Spencer is past president of the Royal Photographic Society), have compiled a short work that manages to treat, however generalized, every major aspect of moviemaking. Fully illustrated with both diagrams and photos, the book is slanted toward the layman, and although the emphasis is on the technical aspects, the coverage is fairly generalized to be of no specific interest to the professional. Written accurately and clearly, this is a handy basic reference.

TELEVISION FACTBOOK No. 22, Television Digest, Wyatt Bldg., Washington D. C., 448 *pages*, $4.50.

All the TV stations in the world, nearly 475 of them in the U.S. and some 200 throughout the rest of the globe, are listed in this latest semi-annual reference edition, which also contains directories of manufacturers of TV equipment, statistical tables on set and tube production and sales, plus many other listings covering the telecasting and electronic industries, complete with addresses, phone numbers, names of key executives and other pertinent data.

Among the more interesting items mentioned in the book are the following: More than 37,000,000 TV sets were active in the U.S. at the end of 1955, while throughout the rest of the world the number of active sets totaled 10,500,000. Last year in this country, 2,370,000 TV sets were scrapped. Also, the normal life expectancy of a TV receiver has been approximated at eight years.

SPLICES NOT HOLDING ?

Film breaks are costly. Play safe by using

JEFRONA

All-purpose CEMENT

Has greater adhesive qualities. Don't take our word for it. Send for FREE sample and judge for yourself.

CAMERA EQUIPMENT CO., INC.
DEPT. J
315 West 43rd Street New York 36, N. Y.
JUdson 6-1420

HILUX®

WORLD'S FINEST ANAMORPHIC PROJECTION LENSES!

Comparison tests in famous theaters throughout the world have proven Hilux Anamorphic Projection Lenses vastly superior. Precision designed and built, they have optimum optical correction for color, definition and distortion. You owe it to your audiences to use Hilux Anamorphics for *ALL* prints.

HILUX VAL



An amazingly precise *variable* anamorphic that gives non-vignetting performance with *both* 4" (101.6mm) and 2 25/32" (70.6mm) diameter prime lenses. Complete control up to 2X without shifting lens or projector.

HILUX 264



A high quality 2X *fixed* anamorphic for all projection lenses up to 2 25/32" (70.6mm) with a 64mm free rear aperture for maximum non-vignetting light transmission.

HILUX 152



A 1.5X to 2.0X *variable* anamorphic for all standard 2 25/32" (70.6mm) projection lenses. 64mm free rear aperture assures maximum light with no vignetting.

Hilux 264 and 152 are available with either fixed or variable corrector lenses. For catalog sheets and focal length computer, write Dept. P-66.

PROJECTION OPTICS

PROJECTION OPTICS CO., INC.
Rochester, N. Y. • London, England

CinemaScope Girdles Globe on Third Anniversary

CinemaScope had its third birthday recently and for a three-year-old it is a large and lusty youngster. The cine process which premiered in 1953 with a gala coming out in "The Robe" in New York's Roxy Theatre, has grown up into a $250.000.000 investment and is installed in 37,000 houses in all parts of the world. 'Scope installations exist in such far-flung points as South Africa, Venezuela, and the Philippines.

Fathered by the late French scientist, Professor Henri Chretien, whose anamorphic lens made possible commercialization of the process, CinemaScope marked a radical departure from "postage sized" screens to universal widescreen presentation. Although there had been dabbling and experiment with wide-screen ideas before, CinemaScope capped the big-picture technique.

It was in 1952 that 20th Century-Fox's Spyros Skouras and Earl Sponable, technical director, first witnessed a demonstration of the Chretien lens at Nice, France. Skouras negotiated an option for it on the spot. Bausch & Lomb later developed the filming and projection lenses.

CinemaScope keeps moving ahead with the development of its "55" embellishment which prints wide-gauge image down to 35-mm for greater depth of focus, brilliance, refinement of grain and distortion.

In the offing is also a 55-mm projector being developed for wide-gauge projection ordered from Century Projector Corp. For the present the scaled down version of the 55-mm film will be used, while the larger projector will be held in abeyance for future road-show application.

Meanwhile CinemaScope moves on with 17,408 installations in the U.S. and Canada and 19,609 installations abroad. Principal CinemaScope markets include: England, 3,225 installations; Italy, 3,011; Germany, 2,521; France. 1,438; Japan, 1,102; Spain 898; Belgium, 823; Australia, 782; Sweden, 570; Brazil, 462; Mexico. 429; Finland, 335; South Africa, 322; Holland, 281; Colombia, 268; India, 261; Philippines. 257; Cuba, 235; Venezuela, 209.



OBITUARIES

SHELTON, ROY, veteran member of Local 159, Portland, Ore., died August 26. A member of the Local for more than 40 years, he had served in various official capacities.

KATZ, SAMUEL, charter member of Local 299, Winnipeg, Man., Canada, died of a heart attack last month while visiting in Vancouver. He was chief projectionist at the Main Street Pool Theatre in Winnipeg. He is survived by his widow, two sons, and three daughters.

GPE Declares Dividend

A dividend of 60 cents per share on common stock has been declared by General Precision Equipment Corporation. Also a regular quarterly dividend of $1.18¾ a share on cumulative preferred stock, and a quarterly dividend of 40 cents a share on new cumulative convertible preference stock have been announced.

Technicolor Nets $1,026,000

Technicolor companies have announced consolidated net earnings of $1,026,000 for the first nine months of 1956. The Technicolor Inc. board of directors also declared a dividend of 12½ cents a share on common stock, making the total dividend for the year 50 cents a share.

HUFF'S PACKAGE COOLING SYSTEM

Consisting of

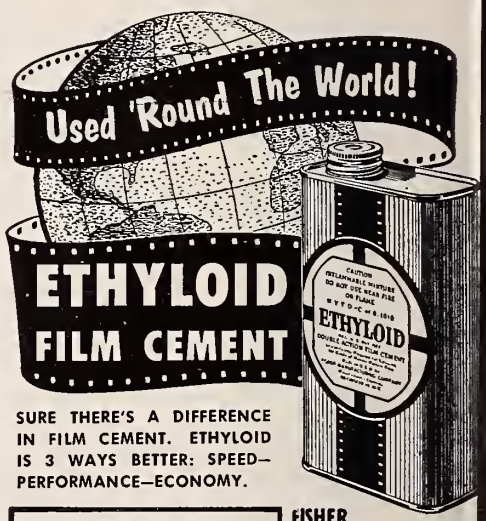
(1) The Positive Carbon Cooler, (2) The Film Track Cooler, and (3) The Automatic Film Humidifier

will give you an advantage of from 10 to 25 per cent more screen light than is now available from your 16- or 18-inch mirror lamps used with Brenkert or X-L heads, plus a saving of 50 per cent lamp maintenance cost.

PROVE THE ABOVE IN YOUR OWN THEATRE.

See your dealer or write direct to

HAL I. HUFF MFG. CO. ● 3774 SELBY AVENUE LOS ANGELES 34, CALIF.



SURE THERE'S A DIFFERENCE IN FILM CEMENT. ETHYLOID IS 3 WAYS BETTER: SPEED—PERFORMANCE—ECONOMY.

AVAILABLE AT ALL THEATRE SUPPLY DEALERS

FISHER MANUFACTURING CO.
1185 Mt. Read Blvd.
Rochester 6, N. Y.

Lorraine ORLUX SUPER-CHARGED LARGE-CORED Carbons

For DRIVE-INS & THEATRES with HUGE, WIDE-AREA SCREENS • CARBONS, Inc. BOONTON, N.J.

NEW STEREOSOUND IDEA

(*Continued from page* 20)

the fourth track of CinemaScope films are generally dispensed with, because to a person sitting near such a speaker, the sound appears to be coming from that speaker instead of being dispersed around him. But if the sound from the auditorium speaker is so delayed that you hear the sound from the stage speakers a fraction of a second before that from the local speaker, the stage speaker will still appear to be the original source of sound. The effect of the auditorium speakers is therefore simply to produce the illusion of sound reflections or reverberation. The idea works. It produces 3-D sound uncanny in its realism.

First we heard a small orchestra playing Mozart. The spacial illusion was so perfect that I noticed immediately that the arrangement of the orchestra was reversed, the violins to my right and the bass and wood-wind to the left. I was told that the recording had been made not from among the audience, but from behind the orchestra, so that the positioning of the instruments would naturally be reversed.

Realistic 3-D Sound

We heard a duet accompanied by piano and harp. Quite definitely the man was standing by the piano on the left, the harp was quite close on the right, and the girl's voice came from just beyond it.

In organ and choral selections, increase of the delay period made the walls of the room seem to open out. The change from a small room to a reverberant church was attained simply by causing the sound from the auditorium speakers to be delayed in phase and increased in volume.

More convincing still, in the darkened auditorium we heard a little play enacted. The setting was a small house. There was a knock on the front door —somebody got up and opened the door. There was the sound of two men arguing; as they came into the room, the argument developed into a quarrel (all in Dutch). A shot rang out—a body fell to the floor just to our left. We heard the murderer's footsteps across the room—a few feet in front of us he started talking to himself. The whole thing was so clear and vivid that we could almost see the actors.

Here was something quite different from the stereo sound in the cinema, because one could actually hear sounds occurring a few feet away, just as in a 3-D film one can see people a few feet away. It was in fact just as realistic as a 3-D film sometimes was, but often was not.

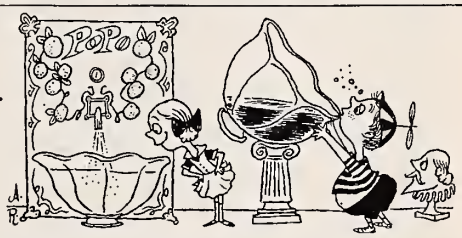
Three things, I suggest, are needed to adapt this system to our existing CinemaScope recording and reproduction methods. First is the substitution of the artificial head for present recording methods which are supposed to involve (but usually don't) three microphones spaced across the set in the studio. In the motion picture theatre, the auditorium speakers fed from the fourth track must be connected through a delay system. Then it would, I imagine, be necessary that the auditorium should be almost completely dead acoustically, so that one hears sound direct from the loudspeakers instead of after repeated reflections.

Is it worth while? In my view, yes. The result was as satisfying to the ear as a well-made and well-projected 3-D film is to the eye and mind. It would justify the vast sums of money that have been spent on what I consider rather ineffective stereophonic equipment in the cinema.

Your carpets may be the thickest...



Your soft drinks may be king-size...



BUT EVERY PERFORMANCE STILL MUST BE PERFECT!

Perfect performances depend so much on the quality of service your equipment receives. Giving the *best* service is the day-by-day job of every expert RCA Theatre Service Engineer. And he alone has behind him all RCA's tremendous technical resources.

RCA SERVICE COMPANY, INC.
A Radio Corporation of America Subsidiary Camden, N. J.

Clayton Ball-Bearing Even Tension Take-Ups
For all Projectors and Sound Equipments
ALL TAKE-UPS WIND FILM ON 2, 4 AND 5 INCH HUB REELS.
SILENT CHAIN DRIVE

THE CLAYTON REWINDER
FOR PERFECT REWINDING ON 2000-FOOT REELS.

CLAYTON PRODUCTS CO.
31-45 Tibbett Avenue New York 63, N. Y.

LIGHTING IN THEATRES

(*Continued from page 33*)

example, mark the scale 0 for the position where the magenta filter just completely covers the beam, and 100 for the point where it just clears the beam when withdrawn. Similarly for the blueviolet and red scales—0 for the point where the filters cover the spotlight beam, 100 for the point where they clear it.

The midpoint of each scale may then be marked as 50, and intermediate points with appropriate values. For convenience in color mixing, the 0, 10, 30, 60, and 100 positions should be considered basic. Even with only these five steps for each filter slide, a total of 125 different colors is possible—24 hues, 36 tints (whitened hues), 36 shades (darkened hues), 24 tones (colored grays), and 5 neutrals (the grays, white, and black).

The "entering edge" of the lemon, magenta, and cyan filters should be as thin as possible to prevent unnecessarily great obstruction of the light when the filters are inserted into the beam only partially. A slide-edge thickness of as much as ¼ inch will do no harm. It may be best not to enclose the large gelatine squares in cover glasses—they may crack,—but rather to secure each gelatine firmly in a metal frame. Replace torn or soiled gelatines promptly, and watch for evidences of fading.

The third idea for a good spotlight color-producing arrangement is the simplest of all, namely, a refinement of the oldfashioned color wheel. If the spotlight or effect machine has a secondary focal plane for the placement of this wheel, only three filter sectors need be used—blueviolet, green, and red. *Keep in mind that lemon, magenta, and cyan cannot be used in a 3-sector wheel because the color mixing is additive, not subtractive.*

A Simple Method

Instead of a circular hole for each filter, however, the wheel must be designed so that the filters adjoin one another closely with straight edges, as shown in the diagram. This allows two colors to be placed over the spotlight lens at the same time for mixture colors (blueviolet and red for the purples and magentas, etc.). A ¼-inch metal separator strip between each pair of filter-sectors is permissible.

It should be noted that the beam area for each primary is reduced when mixture colors are made with a 3-sector wheel. This dims the mixture colors perceptibly. Better results (a smoother transition from color to color as well as brighter mixture colors) are obtained with a 6-sector wheel containing the reciprocals as well as the primaries. *The colors must be arranged in this order, and in no other: Blueviolet, Cyan, Green, Lemon, Red, Magenta.* The process is still additive, but assisted in the mixture colors by the "sandwiched" reciprocal hues, each of which transmits the two adjoining primaries.

Each sector of either of the two color wheels just described must be large enough to cover the spotlight beam completely. Although the 6-sector wheel takes up more room than the 3-sector wheel, the results are so good that we commend it highly.

Color wheels such as these are easy to make and certainly constitute the simplest way of producing colored light in the form of saturated, extra-brilliant hues. (We suggest placing reference marks on the edge of the color wheel to correspond, as nearly as possible, with the 24 standard hues of Table A.) The sole disadvantage of a color wheel is its inability to produce delicately colored tints. Moreover, the wheel must be removed from the machine when white light is desired.

To sum up, carefully balanced primary footlights and striplights on the stage for additive lighting and a subtractive colorplexer for the projection-room spotlight constitute minimum equipment for full, wide-range color-lighting effects. But even with these, a whole new world of theatrical color lighting is opened up—a chromatic world so startling and breathtakingly beautiful that audiences are certain to respond to it by continued and increased patronage.

[THE END]

Q: When is a mistake a blunder?

A: When a projectionist is not a regular subscriber to IP—MUST reading for the projectionist craft.

Use the handy order form below

INTERNATIONAL PROJECTIONIST
19 West 44 St., New York 36, N. Y.

Enter my subscription for ☐ 1 year (12) issues—$2.50
☐ 2 years (24) issues—$4.00

Foreign and Canada: Add 50c per year

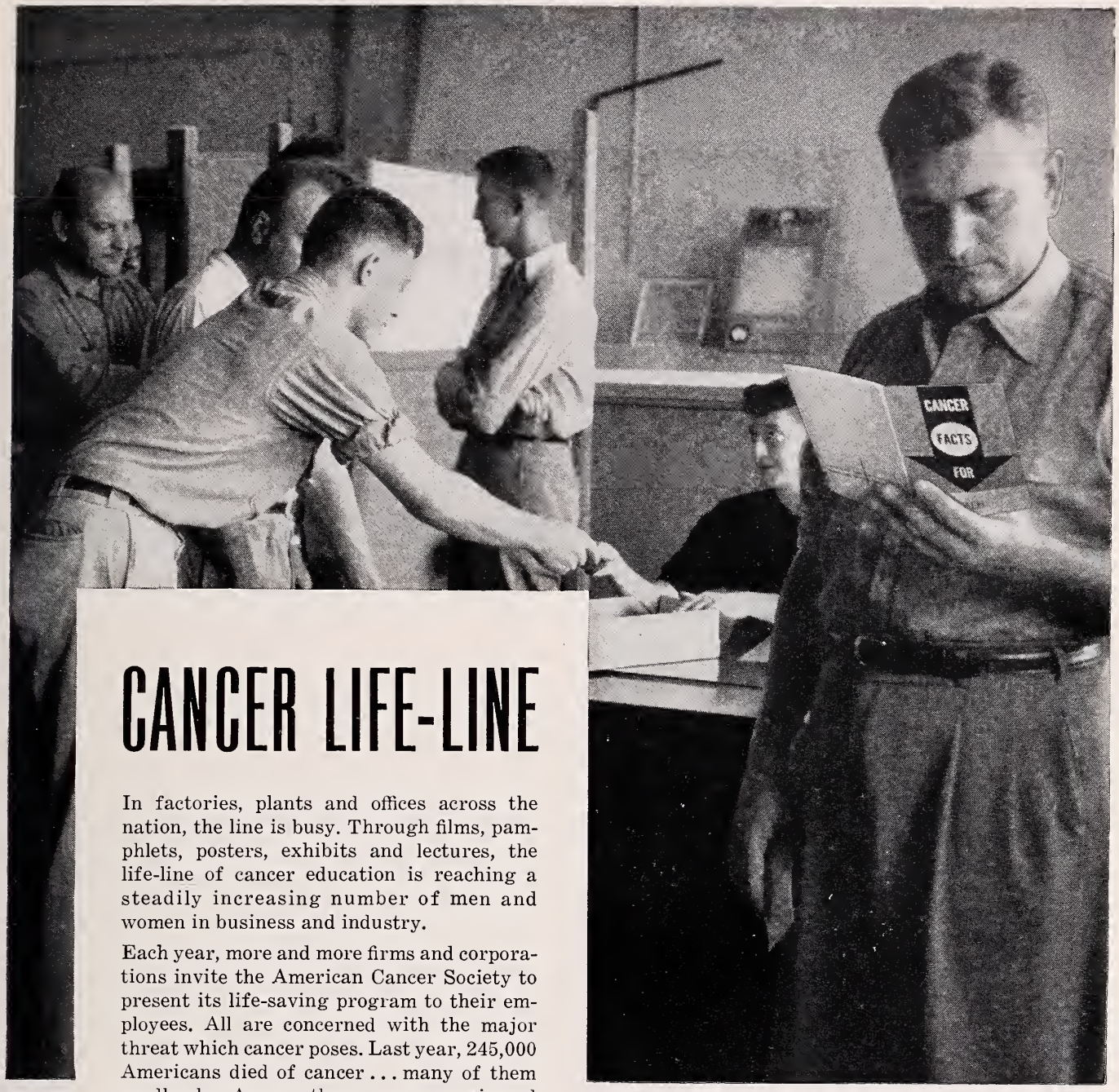
Name .....

Address .....

City ..... *Zone* ..... *State* .....

Deluxe Drive-In Planned

A new addition to the ranks of elaborate showplaces, a drive-in theatre-recreation center, is being planned by a six-man group in Oklahoma City. The major portion of the financing will be through sale of stock at $1 a share to local residents. Cinema-Surf, the corporation's name, is planning to build a twin-screen drive-in theatre accommodating 938 cars; a luxurious restaurant with rooftop dining for summertime; a concession service; a de luxe Surf Club that will have both an adult and children's swimming pool; an amusement park and a free amusement area for children, and an ice skating rink for wintertime. A full-scale advertising campaign is now under way.



CANCER LIFE-LINE

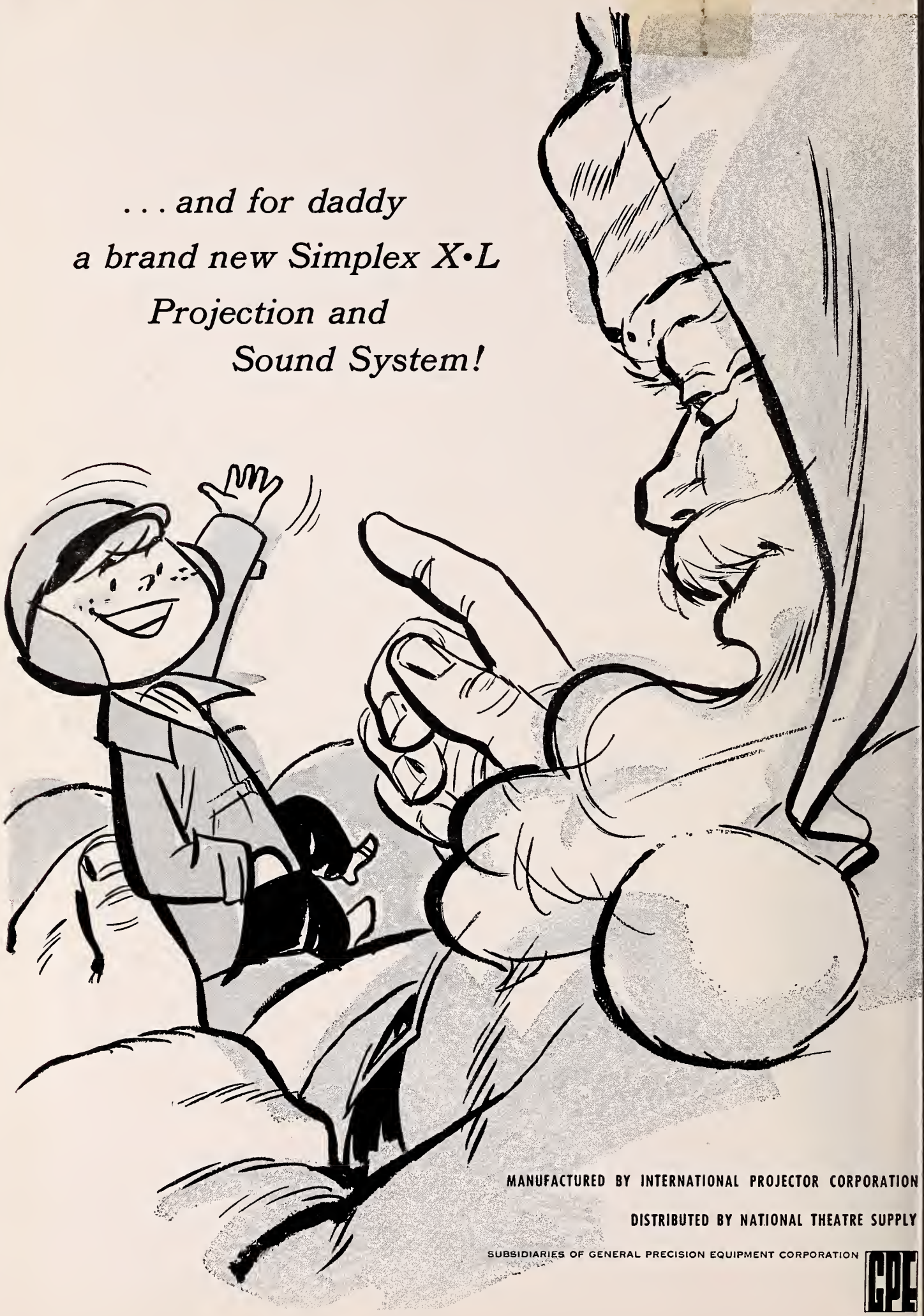
In factories, plants and offices across the nation, the line is busy. Through films, pamphlets, posters, exhibits and lectures, the life-line of cancer education is reaching a steadily increasing number of men and women in business and industry.

Each year, more and more firms and corporations invite the American Cancer Society to present its life-saving program to their employees. All are concerned with the major threat which cancer poses. Last year, 245,000 Americans died of cancer . . . many of them needlessly. Among them were experienced executives, key officials, skilled workers. Their loss to business was incalculable. The greater loss, in terms of personal tragedy, was appalling.

Yet, thousands and thousands of them could have been saved *if they had known the importance of going to their doctors in time.* Early detection plus prompt treatment could literally mean the difference between life and death. This, and many other facts of life about cancer, are part of the education program which the American Cancer Society offers you — in your plant or factory. For additional information, call the American Cancer Society office nearest you, or write to "Cancer" in care of your local Post Office.

AMERICAN CANCER SOCIETY

. . . and for daddy
a brand new Simplex X·L
Projection and
Sound System!

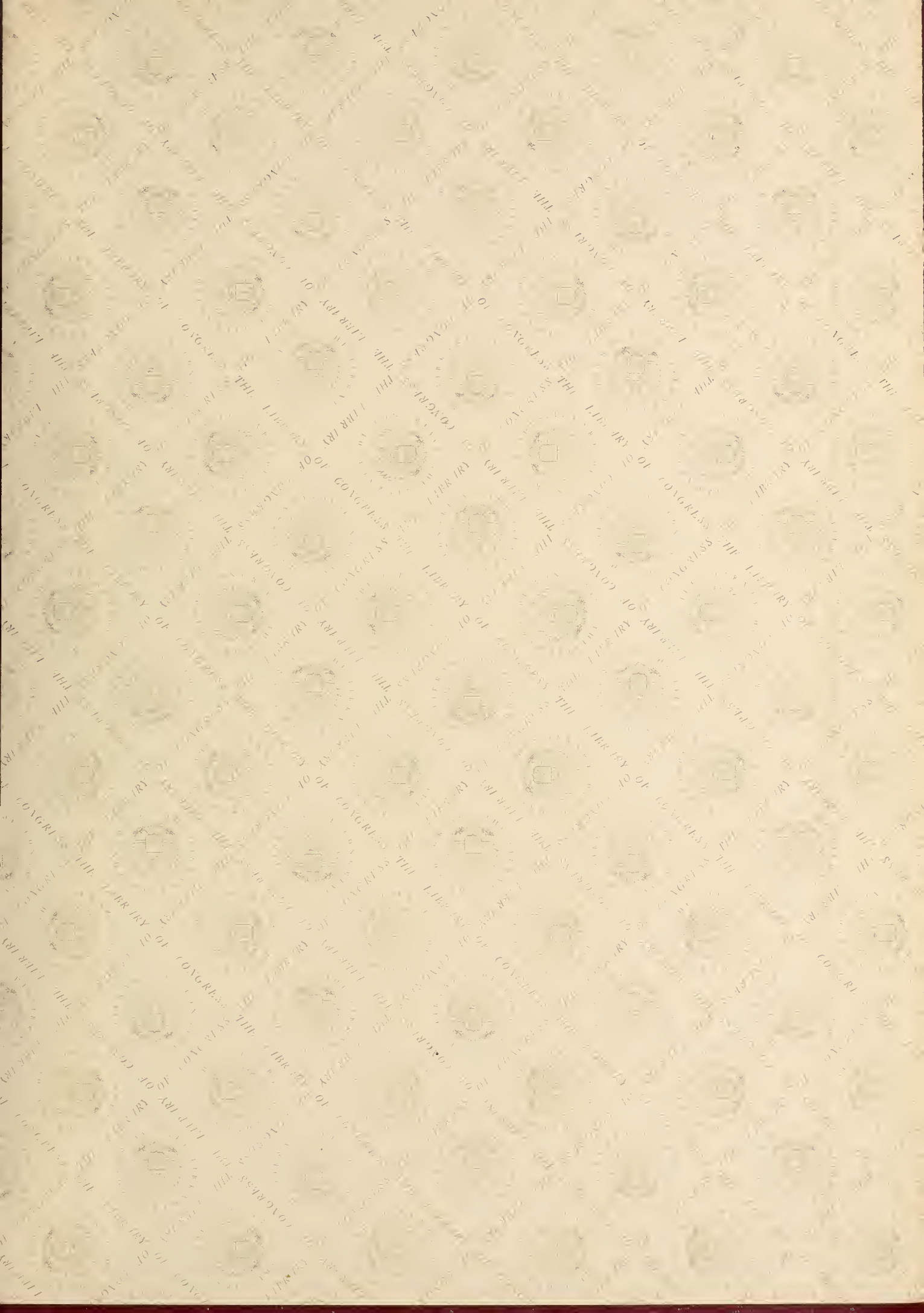


MANUFACTURED BY INTERNATIONAL PROJECTOR CORPORATION

DISTRIBUTED BY NATIONAL THEATRE SUPPLY

SUBSIDIARIES OF GENERAL PRECISION EQUIPMENT CORPORATION

GPE



LIBRARY OF CONGRESS
0 013 660 262 7